Abstract Submitted
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Quantum Hall states in graphene with correlated hopping disorder CAIO LEWENKOPF, Universidade do Estado do Rio de Janeiro, ANA L. C. PEREIRA, Universidade Estadual de Campinas, EDUARDO R. MUCCIOLO, University of Central Florida — Ripples are believed to be one of the important sources of long-range disorder in graphene. Observed both in suspended, as well as in graphene deposited on substrates, smooth ripples can be modeled in the tight-binding Hamiltonian by locally changing the hopping term. We investigate the density of states and the participation ration (PR) of a graphene single-layer sheet with correlated hopping disorder in the quantum Hall regime. We find that for hopping correlation lengths λ larger than the lattice parameter, the width of the nth Landau Level (LL) increases with n. The $n = 0$ LL splits into two peaks, but as λ increases their widths are dramatically reduced. We observe that this width reduction becomes particularly pronounced when λ is of the order or higher than the magnetic length. The analysis of the PR suggests that, with increasing λ, the localization length decreases for the states from the $n > 0$ LLs, while it increases for the $n = 0$ Landau level.

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