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Quantum Hall ferromagnetism in monolayer and bilayer graphene
KENTARO NOMURA, ALLAN MACDONALD, Department of Physics, University of Texas — Graphene is a two-dimensional carbon material with a honeycomb lattice and Dirac-like low-energy excitations. Recent experiments and theoretical studies have clarified the unconventional quantum Hall effects that occur in both graphene systems because of their chiral band structures. In this contribution we address the influence of interaction on the quantum Hall effect in single-layer[1] and bilayer graphene, concentrating on the competition between disorder and interactions and on the variety of broken symmetry states that occur at integer filling factors. We also comment on the unusual fractional quantum Hall effect in bilayer graphene, which is strongest at filling factor ν=2/5 rather than at filling factor ν=1/3.

[1] K. Nomura, A. H. MacDonald, Phys. Rev. Lett. 96, 256602 (2006).

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