

Abstract Submitted
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Effective Magnetic Fields in Graphene Superlattices¹ HERBERT FERTIG, JIANMIN SUN, Indiana University, LUIS BREY, Instituto de Ciencia de Materiales de Madrid — We demonstrate that the electronic spectrum of graphene in a one-dimensional periodic potential will develop a Landau level spectrum when the potential magnitude varies slowly in space [1]. The effect is related to extra Dirac points generated by the potential whose positions are sensitive to its magnitude. We develop an effective theory that exploits a chiral symmetry in the Dirac Hamiltonian description with a superlattice potential, to show that the low energy theory contains an effective magnetic field. Numerical diagonalization of the Dirac equation confirms the presence of Landau levels. Possible consequences for transport are discussed.

[1] Jianmin Sun, H.A. Fertig, and L. Brey, Phys. Rev. Lett. **105**, 156801 (2010).

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