Magnetic field effects on the local electronic structure near a single impurity in Graphene

LING YANG, Department of Physics and Astronomy, University of California, Riverside, California, 92521, JIAN-XIN ZHU, Theoretical Division, Los Alamos National Laboratory, Los Alamos, New Mexico 87545, SHAN-WEN TSAI, Department of Physics and Astronomy, University of California, Riverside, California 92521 — Impurities in graphene can have a significant effect on the local electronic structure of graphene when the Fermi level is near the Dirac point. We study the problem of an isolated impurity in a single layer graphene in the presence of a perpendicular magnetic field. We use a linearization approximation for the energy dispersion and employ a T-matrix formalism to calculate the Green’s function. We investigate the effect of an external magnetic field on the Friedel oscillations and impurity-induced resonant states. Different types of impurities, such as vacancies, substitutional impurities, and adatoms, are also considered.

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