Localized Spins on Graphene

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Graphene is a two dimensional material with a low energy electronic structure corresponding to massless, chiral, fermionic quasiparticles described by the Dirac equation. It is a semimetal that can be globally or locally doped with electrons or holes using gate electrodes. The peculiar electronic properties of this system lead to a number of new and interesting effects. We study the problem of magnetic impurities, atomic or molecular, adsorbed on clean graphene [1]. Using the numerical renormalization group we calculate the spectral, thermodynamic, and scattering properties of the impurities and discuss their potential use to inject and generate spin polarized currents. We show that with a small magnetic field the scattering due to impurities becomes strongly spin dependent and predict new magnetotranspot effects.

1.- P.S Cornaglia, Cornaglia, Gonzalo Usaj, and C. A. Balseiro, Cond-mat 0810.4140 (2008)