

Synthetic Electric Fields in Graphene and Carbon Nanotubes

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Within the Dirac theory of the electronic properties of graphene, smoothly varying lattice strain affects the Dirac carriers through a synthetic gauge field. For static lattice strain, the gauge field induces a synthetic magnetic field which is known to suppress weak localization corrections by a dynamical breaking of time-reversal symmetry. When the lattice strain is time dependent, as in connection with phononic excitations, the gauge field becomes time dependent and the synthetic vector potential is also associated with an electric field. In this talk, I discuss observable consequences of this synthetic electric field.