Anomalous, spin and valley Hall effects in graphene-based structures

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Hybrid graphene-based systems such as graphene deposited on various substrates (e.g. transition metal dichalcogenides or ferromagnetic thin films) as well as graphene decorated by adatoms are currently extensively studied both experimentally and theoretically [1-3]. This interest is mainly due to the possibility of using graphene as an active element of spintronics devices. Owing to the magnetic and spin-orbit proximity effects in hybrid graphene-based structures, enhanced spin-orbit interaction and magnetic moment in the graphene layer can be induced.

Within the linear response theory and Green function formalism we have studied anomalous, spin and valley Hall effects in graphene-based hybrid structures. To describe these phenomena theoretically we have used various forms of the low-energy effective Hamiltonians, which have been derived recently from *ab-initio* calculations (see e.g. [3,4]).

References:

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