Magnetoresistive effects due to k-cubed Rashba spin-orbit interaction at the interfaces of oxides and semiconductors

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Perovskite oxides heterointerfaces attract recently much attention from both experimental and theoretical sides, mainly due to their peculiar electronic properties like two-dimensional metallic conductivity, large magnetoresistance, metal-insulator transition, coexistence of superconductivity and ferromagnetism, and large spin-orbit interaction [1].

Within the Matsubara Green function formalism and linear response theory we consider some of the magnetoresistive phenomena (e.g. anomalous and planar Hall effects, anisotropic magnetoresistance) in a two-dimensional electron gas formed at the perovskite oxides interfaces. We assume the isotropic k-cubed form of Rashba interaction, that fits well to the reported experimental data [2] and is also widely used for modelling of spin-orbit phenomena in p-doped semiconductor heterostructures.

References:

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