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Rashba conducting strips coupled to ferro- and antiferromagnetic layers JOSE RIERA, Instituto de Fisica Rosario- CONICET-UNR — A system composed of a conducting planar strip with Rashba spin-orbit coupling (RSOC), magnetically coupled to a layer of localized magnetic moments, at equilibrium, is studied within a microscopic Hamiltonian with numerical techniques at zero temperature. In particular, transport properties for the cases of ferromagnetic (FM) and antiferromagnetic (AFM) coupled layers are computed in linear response on strips of varying width. In the case of an AFM localized order, results for the optical conductivity, for small strip widths, suggest the proximity to a metal-insulator transition. More interesting, in the proximity of this transition, and in general at intermediate values of the RSOC, it is observed a large spin-Hall conductivity that is two orders of magnitude larger than the one for the FM order for the same values of the RSOC and strip widhts. There are clearly two different regimes for small and for large RSOC, which is also present in the behavior of Rashba helical currents. Different contributions to the optical and the spin-Hall conductivities, of inter- or intraband origin, or coming from the hopping or spin-orbit terms of the Hamiltonian, are examined. Finally, the stability of the AFM order when magnetic moments are allowed to rotate is studied.

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