

Abstract Submitted
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Anisotropic RKKY and Dzyaloshinsky-Moriya interactions in a two-dimensional spin-polarized electron gas with Rashba and Dresselhaus spin-orbit coupling MOHAMMAD MAHDI VALIZADEH, SASHI SATPATHY, University of Missouri - Columbia — Chiral order in magnetic structures is currently an area of considerable interest and leads to such structures as the skyrmion lattice. The chiral structures originate from the Dzyaloshinsky-Moriya (DM) interactions caused by broken symmetry and the presence of the spin-orbit interaction. We study the the indirect exchange interaction between two localized magnetic moments mediated by a spin-polarized 2DEG in the presence of both Rashba and Dresselhaus spin-orbit coupling. We find anisotropic RKKY and DM interactions, e. g., of the form $J_1(S_{1x}S_{2x} + S_{1y}S_{2y}) + J_2S_{1z}S_{2z}$ in the former case, in the presence of a non-zero spin polarization. The magnitude of the vector and tensor DM interactions are estimated and compared to recent experiments on magnetic thin films.

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