Current-induced spin polarization in 2DEG at perovskite oxides interfaces

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The two-dimensional electron gas (2DEG) at the interfaces of transition metal oxides reveals non-trivial electronic and spin properties, which are intriguing due to their fundamental theoretical aspects and promising applications in spintronics. Recently, very large spin-to-charge current conversion due to spin-orbit interaction in these structures has been reported [1]. We will discuss, within the Matsubara Green functions formalism, current-induced spin polarization due to isotropic k-cubed Rashba interaction. Such a form of the spin-orbit coupling at the interfaces is expected in some groups of oxide perovskites, and also effectively fits well to experimental data [2]. We have calculated the temperature dependence of the nonequilibrium spin polarization in nonmagnetic and magnetic cases. In the latter case we have also analysed behaviour of the spin-orbit torque.

References:

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