

Impact of Kondo correlations and spin-orbit coupling on spin and orbital currents in two-orbital quantum dot

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Spin polarized transport through a quantum dot with spin-orbit interaction (SO) coupled to ferromagnetic electrodes is discussed in the strong correlation range in terms of nonequilibrium Green functions formalism within equation of motion method. Three types of spin-orbit coupling are considered: Zeeman-like, orbital-like and Rashba contributions. SO interaction opens off-diagonal spin-orbital transmissions and apart from current with spin component parallel to the polarization, also spin-flip currents appear. In consequence of mixing of spin and orbital channels the nonvanishing spin-opposite and orbital-opposite noise occurs. We also discuss the impact of SO on tunnel magnetoresistance and show that this interaction might change its sign.