

Resonant tunneling through a single level quantum dot attached to ferromagnetic leads with non-collinear magnetizations

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Resonant electronic transport through a non-interacting single-level quantum dot attached to ferromagnetic leads is analyzed theoretically. Magnetic moments of the leads are assumed to be noncollinear. Apart from this, an external magnetic field, noncollinear with the magnetizations, is applied to the system. However, magnetic moments of the leads and the external magnetic field are in a common plane. Basic transport characteristics, including current-voltage curves, linear and nonlinear conductance, and tunnel magnetoresistance associated with magnetization rotation are calculated using the nonequilibrium Green function technique, and the Green functions have been calculated via the equation of motion method. Dependence of the transport characteristics on the system parameters, like energy level position, spin polarization of the leads, asymmetry between right and left leads, has been calculated numerically and the results are discussed from the fundamental and application points of view.

13.4 cm

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9.7 cm