Interference and Coulomb correlation effects in spin–polarized transport through coupled quantum dots

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Spin–dependent transport through two coupled single–level quantum dots attached to ferromagnetic leads with collinear (parallel and antiparallel) magnetizations is analyzed theoretically. The intra-dot Coulomb correlation is taken into account, whereas the inter-dot Coulomb repulsion is neglected. Transport characteristics, including conductance and tunnel magnetoresistance associated with the magnetization rotation from the parallel to antiparallel configurations, are calculated by the noneqiulibrium Green function technique in the linear response regime. The relevant Green functions are derived by the equation of motion method. To close the set of equations we employ the Hartree–Fock approximation. The dot occupation numbers are calculated self–consistently. We have found splitting of the Fano peak in the conductance, induced by the intra-dot interaction. We have also found that the intra-dot correlation gives rise to an enhancement of the tunnel magnetoresistance effect.

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