Spin-Dependent Transport and Densities of States in Non-collinear Magnetic Barriers

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Abstract: The spin-dependent transport properties in the non-collinear pattern of series of δ-magnetic barriers are studied by using scattering theory and Green's function methods. The Green's function is obtained by using distorted wave approach and the scattering matrix is related by Fisher-Lee relationship. In addition to reproducing the results of Papp's and Xu's in parallel and antiparallel configurations, we also obtain further results, where arbitrary orientations of the magnetic barriers and arbitrary number of barriers are included. The main finding of our results is that the signs of polarizations can be switched around some "geometric unpolarized windows". The well-known antiparallel configuration has no such characteristics. Furthermore, we discuss spin-related partial densities of states in both polarized and unpolarized structures.

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