Spin dependent electron tunneling in a ferromagnet superconductor ferromagnet junction

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We study the spin polarized charge transport through a junction consisting of two ferromagnetic metals connected to a superconductor. Using the Bogolubov- de Gennes equation with appropriate boundary conditions we calculate the current and magnetoresistance for the parallel and antiparallel configurations of the magnetic electrodes. In particular, we discuss the nonlocal processes such as the crossed Andreev reflection and elastic co-tunneling. These processes contribute to tunneling a current when the distance between the two magnetic electrodes is comparable to the superconducting coherence length. The dependences of the tunneling transport processes on the strength of the exchange field in the ferromagnetic electrodes, and on the height of the tunnel barriers are presented.

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