

Giant magnetoresistance in nanoscale ferromagnetic heterocontacts

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Abstract

A quasi-classical theory of giant magnetoresistance (GMR) in nanoscale point contacts between different ferromagnetic metals is developed. The contacts were sorted by three types of mutual positions of the conduction spin-subband bottoms which are shifted one against another by the exchange interaction. A model of a linear domain wall has been used to account for the finite contact length. The magnetoresistance is plotted against the size of the nanocontact. In heterocontacts the magnetoresistance effect not only turns out to be negative, as usual, but it can be positive as well. The relevance of the results to existing experiments on GMR in point heterocontacts is discussed. © IOP Publishing Ltd.

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