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Multivalued dependence of the magnetoresistance on the quantized conductance in nanosize magnetic contacts

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Abstract

We calculate the quantized conductance of nanosize point contacts between two ferromagnets for different mutual orientations of the magnetic moments. It is found that the magnetoresistance (MR) is a multivalued function of the quantized conductance at the parallel alignment of the magnetizations σF . This leads us to the conclusion that experimentally observed large fluctuations of MR versus σF are rather due to the conductance quantization than to measurement errors or a poor reproducibility of the results. Using the results of the calculations we are able to understand experimental data obtained by García et al. for MR of the magnetic nanocontacts.
