MONTE CARLO SIMULATION OF MAGNETIC MULTILAYERED STRUCTURES WITH GIANT MAGNETORESISTANCE EFFECTS

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Abstract:

Description of giant magnetoresistance effects in magnetic multilayered structures with the use of the anisotropic Heisenberg model for determination of magnetic properties of thin ferromagnetic films forming these structures is given. Monte Carlo simulations of magnetic properties for structures, which are constructed from two ferromagnetic films divided by nonmagnetic film, are carried out. The temperature and magnetic field dependencies are considered for ferromagnetic and antiferromagnetic configurations of these structures. The calculation of the magnetoresistance coefficient is carried out for different thicknesses of the ferromagnetic films. It was shown, that the obtained temperature dependence for the magnetoresistance coefficient is agreed very well with experimental results, measured for the magnetic multilayered structures similar to structures, which are considered in our investigations.