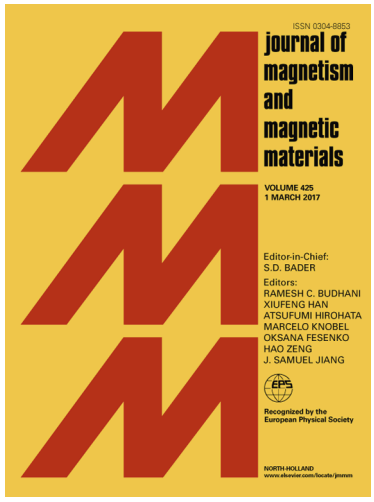

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Domain Wall Structure in Metals: a New Approach to an Old Problem

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Abstract

The Monte Carlo Simulated Annealing (MCSA) method is used for performing micromagnetic simulations, in particular the determination of the domain wall structure originated from the energy's minimization of known micromagnetic hamiltonians. Beside the new theoretical approach, we also discuss the influence of different models for the exchange energy on the wall structure. It was found that the existence of long range exchange, like the RKKY interactions, can significantly affects the domain wall width when compared to the results obtained for the typical Heisenberg like exchange, whose range is restricted to the nearest neighbors. The calculations also indicate that especially for phases with high magnetocrystalline anisotropy the modeling should be performed at atomistic level or, in other words, the Bloch wall continuum model is not valid.

Keywords: A. Metals; B. Magnetic Properties; C. Modelling
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