CORRELATED ROUGHNESS EFFECTS IN THE GIANT MAGNETORESISTANCE IN MAGNETIC MULTILAYERS

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We study interface roughness effects on the giant magnetoresistance in magnetic multilayers with correlated interfaces having non-zero cross correlation function. Initially we present the formalism that accounts for interface electron scattering due to cross correlation. The roughness in each interface is described in terms of the K-correlation model and is characterized by the roughness exponent H (0¡H¡1), the correlation length ξ , and the roughness amplitude δ. The magnetoresistance is strongly sensitive to any differences in the parameters H, ξ, and δ of consecutive interfaces. This sensitivity is additionally influenced by the electronic structure of the multilayer (potential steps at the interfaces).

9.7 cm

13.4 cm

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