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Polarized neutron reflectivity on granular C/FeCo multilayers

Large magnetoresistance(MR) values are expected for FeCo based granular films, because of the large spin polarization of FeCo alloy. The magnetic depth profile of the $[C/FeCo]_n$ multilayers either at individual layer or interfaces in the process of remagnetization is a determinant factor affecting the spin-dependent electronic transport. To obtain the magnetic structure of $[C/FeCo]_n$ multilayers in each FeCo layer and at interfaces, and also to understand the magnetic interaction between the layers with different cycle numbers n , the polarized neutron reflectivity (PNR) is a good technique for these characterizations, which are of great significance to understand the underlying physics of the magnetic multilayers. With polarized neutron reflection(PNR) we get detailed information about the magnetization depth distribution throughout the multilayers and interaction of the magnetic layers with the increase of periodicity cycle. The PNR results showed that periodicity cycle thickness is about 39nm. At 10K multi-domain structure exists in the case of saturation magnetization. There exists exchange coupling between FeCo layers and the interlayer exchange coupling is related to the period number. Without external field, the magnetic structure changes with temperature. Whereas the magnetic structure is not sensitive to temperature in the saturated magnetization state.

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Magnetic thin films and interfaces

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