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Microstructure and magnetic properties of multilayered [Fe/Pt] n structures prepared by successive deposition

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Abstract

The structure and magnetic properties of multilayered [Fe/Pt] n structures prepared by successive magnetron sputtering of Fe and Pt plates and deposition of Fe and Pt layers on a preliminarily heated glass substrate have been studied as functions of the number n and thickness of the layers. Mössbauer studies and measurements of magnetic hysteresis loops (MH) have established that [Fe/Pt] n films for $n = 16$ exhibit primarily magnetic anisotropy normal to the film plane. Data obtained by X-ray photoelectron spectroscopy (XPS) strongly suggest that the films have an interface between the substrate and the multilayered structure. Our micromagnetic modeling leads to the conclusion that the magnetic anisotropy oriented normal to the [Fe/Pt] n film plane (for $n = 16$) is induced by formation of an anisotropic interface.
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