

Influence of He⁺ ion bombardment on domain nucleation in Co based perpendicular magnetic anisotropy multilayers

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The influence of He⁺ ion bombardment (IB) on domains nucleation in Co/Au, Co/Pt, and Co/Pd sputter-deposited multilayers (MLs) with perpendicular magnetic anisotropy was investigated. The MLs were patterned, using electron lithography and a lift-off process, into grids of squares of 32 to 512 μm size and bombarded with different ion fluences. The magnetization reversal was investigated using Kerr microscopy to determine the influence of IB on the effectivity of domain nucleation centers (DNCs). The analysis of the Kerr images allowed us to estimate the DNCs' densities for each material as a function of ion fluence. An Arrhenius-type model of the DNCs and micromagnetic simulations were used to approximate the observed behavior. Preliminary results indicate that the near-edge DNCs are less susceptible to the influence of IB than those within the area of the sample.

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