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Microwave assisted magnetization reversal in cylindrical antidot arrays with in-plane and perpendicular anisotropy MEHMET YUMAK, KERIM TURE, GULEN AKTAS, Bogazici University Department of Physics, VICTOR VEGA, VICTOR PRIDA, Dpto. Física, Universidad de Oviedo, Calvo Sotelo, CARLOS GARCIA, Bogazici University Department of Physics — Porous anodic alumina is a particularly attractive self-ordered system used as template to fabricate nanostructures. The anodic film contains a self-ordered hexagonal array of parallel pores with tunable pore size and interpore distance, and whose pore locations can be templated. Deposition of magnetic films onto porous alumina leads to the formation of porous magnetic films, whose properties differ significantly from those of unpatterned films. The study of antidot arrays has both technological and fundamental importance. Although porous alumina films are typically synthesized in a planar geometry, in this work we deposited NiFe and Ti/CoCrPt magnetic films with in-plane and out-of-plane anisotropy onto cylindrical-geometry porous anodic alumina substrates to achieve cylindrical antidot arrays. The effect of both, the magnitude of the AC current and the circular magnetic field on the magnetization reversal has been studied for in-plane and perpendicular anisotropies. The level of reduction in the switching field was found to be dependent on the power, the frequency of the microwave pulses and the circular applied magnetic field. Such a reduction is associate with the competition between pumping and damping processes.

Mehmet Yumak
Bogazici University Department of Physics

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