Lattice of artificial magnetic domains in Au/Co/Au multilayers

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9.7 cm

Currently, much attention is paid to patterned multilayer systems in which there exists a perpendicular magnetic anisotropy. These multilayer structures are interesting because of their potential applications in spintronics devices and in a new generation of magnetic storage media. In this field, the final goal is to fabricate patterns of individually switchable monodomain areas with negligible mutual interactions. It can be realized in Au/Co/Au multilayers by colloidal domain lithography, which is a new technique enabling modification of magnetic patterns on relatively large areas [1]. Connection of an ion irradiation process and colloidal lithography based on self-assembly of polystyrene beads enables magnetic patterning of regularly arranged cylindrical magnetic monodomains with out-of-plane magnetization. These artificial domains are separated from each other and embedded in an easy-plane anisotropy matrix. They form an almost perfect two dimensional hexagonal lattice with submicron periodicity in a continuous and flat layer system.

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