

Magnetic and magneto-optical properties of Co-based multilayered films prepared by electron-beam evaporation

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ABSTRACT

The magnetic and magneto-optical (MO) properties of Co-based multilayered (ML) films are known to vary sensitively according to the manufacturing methods and the film microstructures. Co/Pd and Co/Pt ML films with ultrathin layers of Co were prepared by alternating deposition in an ultrahigh-vacuum physical-vapor-deposition system. The individual layer thicknesses of the samples were estimated making use of the angular positions of x-ray diffraction peaks. The magnetic and MO properties were investigated, and correlated systematically to the structural parameters of the films. A Kerr spectrometer was self-manufactured to measure the MO properties such as Kerr rotation angle, ellipticity and reflectivity. The rms surface roughness was also measured using atomic force microscopy. Some of the samples showed good properties for MO medium, such as large perpendicular magnetic anisotropy and Kerr rotation, and perfect squareness of the magnetic hysteresis loop.