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**Magnetic and magneto-optical properties of Co<sub>2</sub>MnSi magnetic grating** J.B. KIM, G.J. LEE, Y.P. LEE, q-Psi and Dept. of Physics, Hanyang Univ., Seoul, Korea, C.S. YOON, Dept. of Materials Science and Engineering, Hanyang Univ., Seoul, Korea, J.Y. RHEE, Dept. of Physics, Sungkyunkwan Univ., Suwon, Korea, K.W. KIM, Dept. of Physics, Sunmoon Univ., Asan, Korea — The magnetic and the magneto-optical properties of periodic magnetic structure, produced by the femtosecond-laser induced crystallization of amorphous Co<sub>2</sub>MnSi films, were elucidated. The amorphous Co<sub>2</sub>MnSi films have been prepared by rf-magnetron sputtering on a glass substrate at room temperature. In order to form a grating structure, two-beam interference of femtosecond laser pulses was employed. The atomic-force-microscopy and the transmission-electron-microscopy results show regularly-spaced alternating lines with a periodicity of 2  $\mu\text{m}$ . The magnetic-force-microscopy results reveal the periodic patterns of magnetic domains. The Kerr hysteresis loops of sample were measured by using a magneto-optical microscope. The enhanced magneto-optical properties were observed in the first-order diffracted beam. It was also found that the films with a spatially periodic magnetic structure can be relatively easily fabricated by selectively crystallization of a paramagnetic Co<sub>2</sub>MnSi amorphous film, which crystallizes into a ferromagnetic phase upon illumination with sufficiently intense laser light.

J. B. Kim  
q-Psi and Dept. of Physics, Hanyang Univ., Seoul, Korea

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