MAGNETO-OPTICAL INVESTIGATION OF DOMAIN WALL MOTION IN AMORPHOUS MAGNETIC MICROWIRES

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The intensive studies of magnetic properties of nearly zero magnetostriction Co-rich glass covered microwires are performed in relation with the giant magnetoimpedance (GMI) effect because the GMI effect is of great interest in sensor application. The origin of the GMI effect is related with the penetration depth of the skin effect. Consequently, the magneto-optical Kerr effect (MOKE) investigation on the magnetization reversal in the surface areas of such type of microwires become a particular importance for the GMI sensor application. The MOKE experiments have been directed to the study of the surface circular magnetic domain structure in the crossed circular-axial magnetic fields. This experimental field configuration has been chosen following the field configuration of GMI effect. The domain wall motion has been investigated by the MOKE modified Sixtus-Tonks method. It was found that the pulse-shape circular magnetic field induces the single circular domain wall motion along the microwire. The velocity of the circular domain wall could reach the value of about 2.5 km/cek. The bias axial magnetic field could accelerate or decelerate the domain wall motion. For the first time the axial magnetic field controlled circular domain walls motion has been studied in amorphous microwires. This motion determines basically the transversal susceptibility that in turn is the key parameter influenced on the GMI effect.

9.7 cm

13.4 cm

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