Magnetization reversal and magnetic domain structure in Ne ion irradiated Co/Mo/Co coupled thin film structures

M. Tekielak,[1] Z. Kurant,[1] M. Jakubowski,[2] R. Boettger,[3] A. Maziewski,[1] and A. Wawro[2]

[1] *Faculty of Physics, University of Białystok, Białystok, Poland*
[2] *Institute of Physics, Polish Academy of Sciences, Warsaw, Poland*
[3] *Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Germany*

The Co(3 nm)/Mo wedge (d_{Mo}: 0–3 nm)/Co(3 nm) structure exhibits two-fold in-plane magnetic anisotropy and magnetization of the Co layers parallel (P) or antiparallel (AP) coupled. AP coupling occurs in 0.5 nm$<d_{Mo}<$1 nm range and P coupling beyond this range. Magnetic properties are modified by irradiation with 17 keV Ne ions. The magnetization reversal processes and magnetic domain structure were studied using magnetooptical Kerr magnetometry and microscopy. In the region of AP coupling the independent magnetization reversal of the Co layers is observed. For $d_{Co}<0.5$ nm simultaneous magnetization reversal both Co layers by a domain wall movement towards the higher coercivity region occurs. For $d_{Co}>1$ nm reversal process by domain nucleation with the preferential orientation of domain walls was observed.

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