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

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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 magneto-optical 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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