Quantitative analysis of magnetization reversal behavior of Co/Pt multilayers using magneto-optical microscopy

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We have investigated magnetization reversal of Co/Pt multilayers with perpendicular magnetic anisotropy using the microscopy. We have particularly examined the demagnetization processes of the film with direct observation domain structures as in Fig. 1, where a microscopic demagnetization degree to evaluate efficiency of the processes is introduced [1]. We have also studied the magnetization reversal of the film, beginning with pre-existing nucleation sites, where a strong correlation between the number of nucleation sites and half reversal time has been observed. In addition, symmetry of magnetization behavior along the increasing and decreasing hysteresis branch is also systematically explored [2].

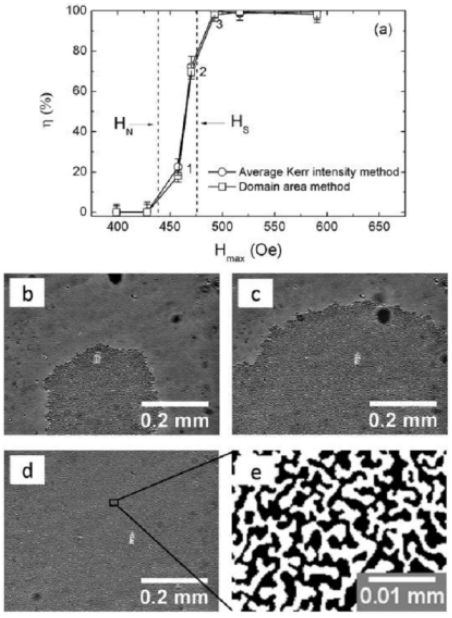

Fig. 1. (a) Variation of demagnetization degree with respect to the demagnetizing field amplitude. Domain patterns of final states after the demagnetization corresponding to (b) point 1, (c) point 2, and (d) point 3 in (a). (e) Zoomed-in view of domain structure of (d).

References

[1] Duy-Truong Quach et al., IEEE Trans. Magn. 50(6), 6500204 (2014); Duy-Truong Quach et al., accepted in IEEE Trans. Magn. (2014).

[2] Duy-Truong Quach et al., BQ-14, MMM (Hawaii, 2014).