Abstract Submitted
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Magnetic domain response to strain generated by focused surface acoustic waves .[1] UDAY SINGH, SHIREEN ADENWALLA, University of Nebraska - Lincoln — The effects of strain on magnetostrictive ferromagnets include changes in the magnetization, anisotropy and domain wall velocities. A ferromagnet (FM) on the surface of a surface acoustic wave (SAW) is subjected to periodic compressive and tensile strain that has resulted in coherent rotation of the magnetization, as well as inducing ferromagnetic resonance in FM films. We describe the response of magnetic domains in Co/Pt multilayers when subjected to the high strains generated by a focused SAW. Annular interdigital transducers (AIDT) patterned on $LiNbO_3$ form a SAW standing wave pattern with large strain amplitude at the focal center. Domains in [Co(3A)/Pt(8A)]x5 with perpendicular magnetic anisotropy were observed using a MOKE microscope within this focal region. Controlled magnetic pulses steered a magnetic domain boundary to the large strain region after nucleation.Excitation of the AIDT resulted in a reversible change in the domain wall boundary in the high strain region. We attribute this to magnetic anisotropy changes in the presence of RF strain, which results in changes in the domain configuration to minimize the free energy. We will present results showing both slow and fast magnetization changes in Co/Pt occurring in the presence of high frequency strain. This work is supported by NSF (DMR 1409622) and Nebraska MRSEC (DMR-1420645).

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