Abstract Submitted
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Gilbert damping parameter characterization in perpendicular magnetized Co_2FeAl films[1] YISHEN CUI, JIWEI LU, University of Virginia, BEHROUZ KHODADADI, SEBASTIAN SCHÄFER, TIM MEWES, University of Alabama, STUART WOLF, University of Virginia — Materials with perpendicular magnetic anisotropy(PMA) have gotten extensive recent attention because of their potential application in spintronic devices such as spin transfer torque random access memory (STT-RAM). It was shown that a much lower switching current density(J_C) is required to write STT-RAM tunnel junctions with perpendicular magnetic anisotropy ferromagnetic electrodes (p-MTJ). Additionally Heusler alloy Co_2FeAl is expected to further reduce J_C due to its ultra low Gilbert damping parameter. In our study, Heusler alloy Co_2FeAl films were prepared using a Biased Target Ion Beam Deposition (BTIBD) technique. We demonstrated a low Gilbert damping parameter achieved in thick B2-Co_2FeAl films. Besides, we achieved an interfacial PMA in ultra thin Co_2FeAl films by rapid thermal annealing (RTA) with no external field presented. Annealing conditions were carefully adjusted to maximize the interfacial PMA. However it was noticed that a higher annealing temperature was required for a low damping parameter which to some extent sacrificed the interfacial PMA. We also deposited ultra thin CoFeB films and characterized their damping parameters for comparison.

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