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Magnetostatics and magnetodynamics in Co_2MnSi on GaAs (001)[1] MICHAEL PECHAN, DANIEL STANLEY, MICHAEL SINKO, Department of Physics, Miami University, SAHIL PATEL, Department of Electrical and Computer Engineering, University of California, Santa Barbara, ALEXANDER KOZHANOV, Department of Physics and Astronomy, Georgia State University, BRIAN SCHULTZ, CHRIS PALMSTROM, Department of Electrical and Computer Engineering, University of California, Santa Barbara — We present an investigation of the magnetic properties of Co_2MnSi films grown by molecular beam epitaxy on lattice matched $Sc_{0.3}Er_{0.7}As$ films grown on GaAs (001) substrates with various capping layers (Cr, Al, Au). Co_2MnSi thickness varied from 3 to 21.4 nm. X-ray diffraction analysis confirmed the single crystal nature and crystallographic orientations of the films. Magnetization measurements reveal square loops with low in-plane saturation fields and very narrow (few Oe) coercive fields. An interesting feature of the loops in several of the samples is the presence of a small (<10 Oe) exchange-bias field observed at room temperature. Room temperature ferromagnetic resonance (FMR) measurements were carried out at 35 GHz as a function of in-plane angle to quantify the anisotropy in these structures. Resonances follow the typical derivative lineshape with relatively narrow line widths ranging from 30 to 140 Oe, consistent with high quality Heusler alloy film formation. Four-fold anisotropy is clearly observed in all samples confirming the high quality single-crystal nature of the films. A small unidirectional anisotropy associated with the exchange bias mentioned above is also observed. We will also present results on preliminary MJT structures.

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