Abstract Submitted
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Broadband ferromagnetic resonance in epitaxial magnetic thin films and bilayers XIAOBIN ZHU, D. LAGARDE, Z. LIU, M. FREEMAN, University of Alberta, G. WOLTERSDORF, A. OMOSENDZ, B. KARDASZ, B. HEINRICH, Simon Fraser University — Broadband ferromagnetic resonance is used to study spin dynamics in epitaxial Au(20)/Fe(16)/GaAs(100), Au(20)/Cr(20)/Fe(16)/GaAs, and Au(15)/Fe(30)/Au(21)/Fe(15)/GaAs structures, where the numbers represent the atomic layers. Angular and external bias field dependence of resonance frequency for single magnetic layers could be explained by considering the coexistence of fourfold crystalline anisotropy and a uniaxial anisotropy. The damping parameters are obtained through fitting the experimental data. For Fe film covered with Au, α (0.0037) is consistent with bulk material. However for the film covered with Cr, substantial faster decay of the precessional amplitude is observed [1]. In the magnetic bilayers, the probe beam probes both magnetic layers. Through Fourier transforming the time-domain signals, two resonance frequencies were found: one corresponds to the top layer and the other one corresponds to the bottom layer. The bias field dependence of the resonance frequency for each thin layer however cannot simply be explained by the behavior of each isolated layer, which suggests there exists magnetic coupling, i.e. weak exchange coupling or dynamic dipolar coupling. [1] B. Heinrich et al, PRL 90, 187601 (2003)

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