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Ultrafast laser excitation of coherent spin waves in exchange-biased IrMn/Co KEOKI SEU, HAILONG HUANG, ANNE REILLY, Physics, College of William and Mary — Recent experiments have shown that coherent magnetization oscillations could be set up by ultrafast laser pulses in any magnetic film by manipulation of the anisotropy(1). These experiments are in analogy with FMR, but with the benefit of direct access to the time domain, sub-micron spatial resolution and straightforward in-situ application. We have produced coherent spin waves in exchange-biased Co systems by ultrafast laser pump-probe magneto-optical Kerr effect (MOKE). A static magnetic field is applied at an angle from the pinning axis and ultrafast photoexcitation is used to spontaneously decouple the antiferromagnetic/ferromagnetic system through electron heating(2). We have observed single-frequency oscillations which depend weakly on exchange bias field strength and correspond to ferromagnetic resonance frequencies. The damping of these oscillations are strongly dependent on the exchange bias field strength indicating that the exchange bias field plays a role in the damping. We have measured these oscillations and damping as a function of the angle between the exchange bias field and applied field, and correlated these results to FMR predictions. References: 1 M. van Kampen et al., Phys. Rev. Lett. 88 227201 (2002) 2 G. Ju et al., Phys Rev Lett 82 3705 (1999), Phys Rev. B., 62 1171 (2000)

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