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The Dynamic Phase Transition in Ultrathin Co/Pt-Multilayer Films: Experimental Evidence and Comparison with Simulations D.T. ROBB, Florida State Univ., Y.H. XU, O. HELLWIG, A. BERGER, Hitachi Global Storage Technologies, M.A. NOVOTNY, Mississippi State Univ., P.A. RIKVOLD, Florida State Univ. — The dynamic phase transition (DPT), observed in numerical simulations of magnetic systems [1,2], manifests itself by the spontaneous occurrence of a non-vanishing period-averaged magnetization (the order parameter Q) when the frequency f of an applied alternating magnetic field exceeds a critical value f_c. Near f_c, the DPT shows all common characteristics of a second-order phase transition. Our experimental studies of ultrathin Co/Pt-multilayers provide the first strong experimental evidence of a DPT. The multilayer structure results in perpendicular anisotropy and negligible demagnetizing effects [3]. We measure out-of-plane magnetization time series by the polar-Kerr effect as a function of f and an applied bias field H_b, observing a sharp increase in Q as f is increased above f_c. In addition, we see sharp switching of Q as H_b is changed from positive to negative values. The data sets allow the assembly of an experimental phase diagram. Detailed comparison with simulations of a kinetic Ising model provides strong evidence that our data represent the first unequivocal experimental observation of the DPT. [1] S.W. Sides et al., Phys. Rev. Lett. **81**, 834 (1998) [2] B. Chakrabarti and M. Acharyya, Rev. Mod. Phys. **71**, 847 (1999) [3] Y.Yafet and E.M. Gyorgy, Phys. Rev. B **38**, 9145 (1988).

D.T. Robb
Florida State Univ.

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