Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Ferromagnetic resonance studies of Co and Pt/Cu/Co/Cu/Pt layered ultrathin films[1] J.-M. L. BEAUJOUR, A. D. KENT, Department of Physics, NYU — Ferromagnetic resonance studies of polycrystalline Co thin films and Pt/ Cu/Co/Cu/Pt layered structures have been carried out with Co layer thickness varying from 1 to 70 nm. The resonance field and linewidth were studied as a function of the ferromagnetic layer thickness at room temperature and as a function of applied field. The films were grown by e-beam and thermal evaporation in UHV using an in-situ wedge growth mechanism. The absorption line was measured using a strip-coil by sweeping the in-plane field at fixed frequency ranging from 5 GHz to 10 GHz. It was found that the width of the absorption line, which has a Lorentzian shape, has a linear dependence on frequency. The intrinsic Gilbert damping constant α was extracted from the slope of the line. For both single films and layered structures, α decreases with decreasing Co thickness. In addition, the resonance field is larger than expected based on the Kittel formula. We are presently performing FMR studies of films where the thickness of the Co layer is well below 10 nm. A broadband coplanar transmission line has been designed to work in the frequency range of 5GHz to 20GHz to measure the complex susceptibility of ultrathin magnetic films. In addition, the resonance frequency and the Gilbert damping constant will be studied as a function of the Cu layer thickness and interface nature (Co/Cu, Co/Pt, Co/Cu/Pt).

[1]Supported by NSF-DMR-0405620

Andrew Kent
Department of Physics

Date submitted: 01 Dec 2004 Electronic form version 1.4