Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Gilbert Damping in Single-Crystalline Ni/MgO(001)[1] KEVIN J. SMITH, R. ALE LUKASZEW, ANNE REILLY, Department of Physics, College of William and Mary, GUNTER LÜPKE, Department of Applied Science, College of William and Mary — The dynamical properties of Nickel and Nickel alloys are of great interest in spintronic applications, as these materials exhibit low coercivity and significant magnetoresistance, however, the interplay of the various damping mechanisms, such as two magnon scattering and local resonance, is not well understood. The frequency, ω, and Gilbert damping, α, behavior of uniform spin precession on Ni/MgO(001) are studied over a wide range of external field angles and magnitudes using the Time-Resolved Magneto-Optical Kerr effect (TR-MOKE). The damping parameter shows a strong dependence on the magnetocrystalline anisotropy, suggesting a tuneability of α over the range of 0.09 to 0.5. Two separate trends in α vs. ω are observed depending on the magnitude and direction of the applied field when applied in-plane, indicating the presence of competing damping mechanisms. We further investigate these properties in measurements in which the external field is applied normal to the sample plane, thereby minimizing the role of two magnon scattering.

[1]Financial support provided by the National Science Foundation through grant DMR-0605661.

Kevin J. Smith
College of William and Mary

Date submitted: 27 Nov 2007 Electronic form version 1.4