Abstract Submitted
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Anisotropic Damping in Single-Crystalline Ni/MgO(001) studied by the Time-Resolved Magneto-Optical Kerr effect (TR-MOKE) KEVIN SMITH, A. LUKASZEW, J. SKUZA, C. CLAVERO, K. YANG, A. REILLY, G. LÜPKE, College of William and Mary — The damping behavior of uniform spin precession in single- crystalline Ni/MgO(001) of various thicknesses from t = 10 nm to t = 60 nm is investigated in the time domain using TR-MOKE over a wide range of external field parameters and temperatures. Planar measurements indicate that the effective Gilbert damping parameter, α_{eff}, is coupled to the magnetocrystalline anisotropy, as α_{eff} ranges from 0.05 near the hard axis to 0.10 near the easy axis. Previous experiments by other groups using FMR [1] and TR-MOKE on polycrystalline samples [2] have placed the intrinsic value of the damping at 0.045. When the field is applied normal to the film surface, α_{eff} increases to as high as 0.3 when the angle of the magnetization, ϕ_{M}, is greater than 45 degrees out of plane. These results are discussed in terms of various models of extrinsic damping mechanisms, such as two magnon scattering. [1] S. Bhagat et al. Phys. Rev. B, **10** 179 (1974) [2] J. Walwoski et al. J. Phys. D: Appl. Phys. **41** 164016 (2008)

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