Magnetization Dynamics and Anisotropy in Ferromagnetic/Antiferromagnetic Ni/NiO Bilayers

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Abstract

Magnetization dynamics and anisotropy of a Ni/NiO bilayer have been studied by static magneto optical Kerr effect (MOKE) and time resolved pump-probe MOKE. The time domain measurements show coherent magnetization oscillations on the picosecond scale whose frequency fits well to FMR equations used for frequency domain measurements. Anisotropy constants extracted from the time domain data agree with the findings of the static MOKE measurements and reveal tetragonal and uniaxial components induced by the strain in the lattice-mismatched Ni/NiO bilayer. Studies of the Gilbert damping show a strong effect of the sample's anisotropy on the frequency dependence of the damping that has not been mentioned in the literature so far.