Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Interaction of surface acoustic waves in the GHz frequency regime with ferromagnetic thin films[1] R. HUBER, S. NEUSSER, D. GRUNDLER, Physik Department E10, TU Muenchen, D-85748 Garching, Germany, M. WEILER, S.T.B. GOENNENWEIN, Walther-Meissner-Institut, BAdW, D-85748 Garching, Germany, M. SCHNEIDER, Paul Scherrer Institut, CH-5232 Villigen PSI, Switzerland, P. BOENI, Physik Department E21, TU Muenchen, D-85748 Garching, Germany — We report GHz spectroscopy on ferromagnetic(FM)/piezoelectric hybrid systems consisting of FeCoV or Co on LiNbO substrates, where surface acoustic waves (SAWs) propagate through the FM film. Thereby we study the dynamic coupling of mechanical motion and magnetization in the GHz frequency regime. The 50 nm thick FM films are deposited between two nanopatterned interdigital transducers (IDTs). Using a vector network analyzer connected to the IDTs we detect the variations in amplitude A and phase Φ of the SAWs when applying in-plane magnetic fields H under different angles α. [1] When the SAW frequency is intentionally below the ferromagnetic resonance (FMR) frequency we observe a hysteretic behavior of A and Φ when varying H. Depending on the magnetic anisotropy we find either a fourfold symmetry (FeCoV) or a much more complex behavior (Co) of Φ vs α. We explain this by magnetoelastic effects. When SAW and FMR frequencies are almost degenerate, no clear hysteresis is observed for A. [1] R. Huber et al., Solid State Comm., in press.

[1]Funded by the German Excellence Cluster "Nanosystems Initiative Munich (NIM)"

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Date submitted: 12 Mar 2010 Electronic form version 1.4