Abstract Submitted
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Superlattice effects on spin precession in lateral ferromagnetic heterostructures[1] NIKOLAY POLUSHKIN, STEVEN MICHALSKI, ROGER KIRBY, Department of Physics and Astronomy, University of Nebraska-Lincoln, 68588-0111, Lincoln, NE, FAST MAGNETIZATION DYNAMICS LABORATORY TEAM — Wang and Tilley have developed a model to describe spin wave behavior in systems of magnetic stripes separated by non-magnetic spacers.[1] A key parameter defining spin-wave excitation features in periodic systems is the QD product, where Q is the wavenumber of excited magnons and D the superlattice period. In the long-wavelength limit when QD<<1, spin-wave frequencies can be calculated analytically. We have extended the Wang and Tilley model to describe spin-wave behavior in striped media with stripes of two different magnetizations. The analysis reveals the existence of a basic difference in the spectra for different geometries of the applied magnetic field. For instance, two dominating modes occurring under parallel field orientation reduce to a single mode if the field is oriented in the transverse direction. This crossover reflects the different arrangement of the effective medium permeability tensor, which depends on the geometry of the field. This analysis is applied to our pump-probe studies of patterned heterostructures of submicron-width Fe-V stripes. [1]X.Z. Wang and D.R. Tilley, Phys. Rev. B 50, 13472 (1994).

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Nikolay Polushkin

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