Abstract Submitted
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Magnetic and mechanical characterizations of ultra-high frequency nanoelectromechanical systems (NEMS) JOE LOSBY, N. LIU, Department of Physics, University of Alberta, C. HOLT, Department of Chemical and Materials Engineering, University of Alberta, D. MITLIN, Department of Chemical and Materials Engineering, University of Alberta and National Institute of Nanotechnology, A.E. FRASER, V. SAUER, W.K. HIEBERT, National Institute of Nanotechnology, M.R. FREEMAN, Department of Physics, University of Alberta and National Institute of Nanotechnology — Recent efforts in our group involve time-domain studies of the motion of silicon NEMS[1] and spin dynamics in nanometer-scale permalloy elements[2]. Transduction of microwave frequency (> 1 GHz) cantilevers, and time domain coherent control ("unringing") of nanoscale resonators have been demonstrated. For the next stage of this work, we have fabricated permalloy NEMS cantilevers and doubly clamped beams in order to begin exploration of magnetomechanical dynamics in ferromagnetic nanostructures. The magnetization of these resonators is probed using time-resolved magneto-optical Kerr effect microscopy, while stroboscopic optical interferometry is used for the detection of vibrational modes.
1. N. Liu, F. Giesen, M. Belov, J. Losby, J. Moroz, A. E. Fraser, G. McKinnon, T. J. Clement, V. Sauer, W. K. Hiebert & M. R. Freeman, Nature Nanotechnology, In Press (2008).2. Z. Liu, R.D. Sydora, and M.R. Freeman, Phys. Rev. B. **77**. 174410 (2008).

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