

Abstract Submitted  
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**Ultra-fast Creation and Destruction of Ferromagnetic nanowires**

KENNETH BURCH, Department of Physics, University of Toronto, F. CHEN, A. AZAD, J. O'HARA, Los Alamos National Laboratory, S. MACK, Center for Spintronics and Quantum Computation, University of California, Santa Barbara, A.M. DATTELBAUM, G. MONTANO, V.S. ZAPF, Los Alamos National Laboratory, D.D. AWSCHALOM, Center for Spintronics and Quantum Computation, University of California, Santa Barbara, R.D. AVERITT, Department of Physics, Boston University, A.J. TAYLOR, Los Alamos National Laboratory — The field of nano-spintronics aims to deliver novel multi-functional devices by manipulating magnetism on unprecedented length and time scales. Here we present a technique for ultra-fast creation and destruction of ferromagnetic nanowires at room temperature. We focus on MnAs films where ferromagnetic nanowires are observed within  $\pm 20$  degrees of room temperature. The existence of the nanowires is monitored via Terahertz Time Domain spectroscopy (THz-TDS) through the anisotropic transmission that they induce. Upon optical excitation, the ferromagnetic nanowires are either created or destroyed, depending on the temperature and history of the sample. Thus we provide a new method for the detection and manipulation of magnetism on the nanoscale.

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