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Injection and Propagation of Magnetic Domain Walls in Thin Film Nanowires[1] CARL KNUTSON, GEOFFREY BEACH, JAMES ERSKINE, MAXIM TSOI, Dept of Physics, The University of Texas at Austin — The fields required for injection and propagation of magnetic domain walls in thin-film nanowires were studied using high-bandwidth scanning Kerr polarimetry. This method has recently been used for studying the field- and current-driven dynamics of magnetic domain walls [1, 2]. Nanowires of various widths were fabricated from a 20 nm-thick film of Permalloy ($Ni_{80}Fe_{20}$) etched using a focused ion beam (FIB). These wires were joined at their ends by large-area continuous film regions. Domain walls were introduced into a wire by applying an injection field sufficient to "inject" a nucleated wall from the continuous film into the geometrically-constrained wire neck. After injection, a dc propagation field, typically less than the injection field, is capable of driving the wall at a constant velocity. The influence of nanowire geometry on the injection and propagation fields, and the variation of these fields induced by a dc spin-polarized electric current, will be discussed. [1] G.S.D. Beach, C. Nistor, C. Knutson, M. Tsoi, J.L. Erskine, Nat. Mater. **4**, 741 (2005). [2] G.S.D. Beach, C. Knutson, C. Nistor, M. Tsoi, J.L. Erskine, Phys. Rev. Lett. **97**, 057203 (2006).

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