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Trapping and manipulating magnetic domain walls in patterned (Ga,Mn)As devices K. F. EID, GANG XIANG, O. MAKSIMOV, A. BALK, N. SAMARTH, Physics Department and Materials Research Institute, Penn State University, University Park PA 16802. — We report magnetoresistance measurements that probe the trapping and manipulation of magnetic domain walls (DWs) in multi-element (Ga,Mn)As devices that include both vertically patterned (step-etched) microstructures [Yamanouchi et al, Nature 428, 539 (2004)] and laterally-patterned nanostructures. We exploit post-fabrication annealing to yield devices in which different elements have distinct switching fields, thus allowing us to establish stable antiparallel magnetization states separated by single DWs. We then use current pulses to manipulate DWs in these devices, and observe current-induced DW motion in some sample geometries. We describe ongoing efforts to map out the variation of electrically-driven DW motion with factors such as current amplitude, sample temperature and sample geometry. Supported by DARPA/ONR.

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