Spin torque and domain wall velocity in ferromagnetic semiconductor $\pi$ and $2\pi$ Néel walls E.A. GOLOVATSKI, M. E. FLATTÉ, OSTC and Dept. of Physics and Astronomy, University of Iowa — The motion of a domain wall under an applied spin-polarized current[1] has interesting device applications for the development of spintronic devices. We model $2\pi$ Néel walls (energetically favorable in thin films) in ferromagnetic semiconductors, and compare the results to those for the more-frequently studied $\pi$ walls. Under coherent transport conditions, analytic solutions for spin-dependent reflection and transmission coefficients are possible[2,3]. We calculate charge resistance, spin torque, and domain wall velocity. We find the peak spin torque is more than twice as large for a $2\pi$ wall than for a $\pi$ wall. We also find that the peak velocity of a $2\pi$ wall is larger than that of a $\pi$ wall, but the peak velocities of $3\pi$ and $4\pi$ walls are smaller than those of both $\pi$ and $2\pi$ walls. This work was supported by an ARO MURI.


E.A. Golovatski
OSTC and Dept. of Physics and Astronomy, University of Iowa

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