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Spin torque and domain wall velocity in ferromagnetic semiconductor π and 2π 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 2π Néel walls (energetically favorable in thin films) in ferromagnetic semiconductors, and compare the results to those for the more-frequently studied π 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 2π wall than for a π wall. We also find that the peak velocity of a 2π wall is larger than that of a π wall, but the peak velocities of 3π and 4π walls are smaller than those of both π and 2π walls. This work was supported by an ARO MURI.

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

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