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Spin Transfer Torque Generated by the Topological Insulator Bismuth Selenide ALEX MELLNIK, JENNIFER L. GRAB, PETER J. MINTUN, Cornell University, JOON S. LEE, ANTHONY RICHARDELLA, Pennsylvania State University, ROBERT A. BUHRMAN, Cornell University, NITIN SAMARTH, Pennsylvania State University, DAN C. RALPH, Cornell University — We measure large spin-transfer torques generated by in-plane currents in thin films of the topological insulator bismuth selenide at room temperature. We use spin-torque ferromagnetic resonance in $Bi_2Se_3/Ni_{81}Fe_{19}$ bilayers to determine that the spin-torque arising from the Bi_2Se_3 and acting on the $Ni_{81}Fe_{19}$ layer possesses substantial vector components both in the sample plane and perpendicular to the plane. The out-of-plane torque is several times larger than expected from the Oersted field, and the efficiency of in-plane (anti-damping) spin torque generation per unit current density in the Bi_2Se_3 is greater than has been observed in any other material.

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