

Abstract Submitted
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Spin torque and spin current in magnetic tunnel junctions¹ MAIR-BEK CHSHIEV, WILLIAM H. BUTLER, Center for Materials for Information Technology, The University of Alabama, Tuscaloosa, AL, ALAN KALITSOV, NICK KIOUSSIS, Department of Physics, California State University, Northridge, CA — In recent years, current-induced spin torque [1] has attracted strong interest both because it may advance our understanding of fundamental physics and because it may have useful applications. We present a study of non-equilibrium spin currents and the corresponding spin torques in magnetic tunnel junctions with non-collinear moments. Calculations are based on the Keldysh formalism in which the non-equilibrium Green functions are calculated within a tight-binding model using the technique of Caroli et al. [2]. The properties of spin torque and spin currents are studied as a function of applied bias, barrier thickness and lattice structure type. In addition, the exchange coupling between ferromagnetic layers in magnetic tunnel junctions is investigated via its relation to the current induced spin torque. [1] J. C. Slonczewski, *J. Magn. Magn. Mat.* 159, L1 (1996); L. Berger, *Phys. Rev. B* 54, 9353 (1996); E. Myers, D. Ralph, J. Katine, R. Louie, R. Buhrman, *Science*, 285, 867 (1999). [2] C. Caroli, R. Combescot, P. Nozieres, D. Saint-James, *J. Phys. C: Solid St. Phys.*, 4, 916 (1971).

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Mairbek Chshiev
Center for Materials for Information Technology, The University of Alabama, Tuscaloosa, AL

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