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First principles theory of the current-modulated exchange bias. PAUL HANEY, U. Texas at Austin, REMBERT DUINE, Utrecht University, ALVARO NUNEZ, Instituto de Fisica, PUCV, OLLE HEINONEN, Seagate Technology, ALLAN MACDONALD, U. Texas at Austin — Recent experiments[1] have demonstrated the influence of current on exchange-bias fields in point-contact spin-valve structures. With this motivation, we consider current induced torques in multilayer structures containing ferromagnetic, paramagnetic, and antiferromagnetic layers. Our description is based on ab initio spin-density-functional theory combined with the non-equilibrium Greens' function formalism and direct microscopic evaluation [2] of spatially resolved torques. We find that current induced torques are generically present in both ferromagnetic and antiferromagnet layers. We theoretically demonstrate that current-induced torques in an antiferromagnetic layer that is exchange coupled to a ferromagnetic layer can alter exchange bias and discuss materials combinations in which this effect can be exploited. [1] Wei et al.. cond-mat/0606462 [2] Haney et al.. cond-mat/0611534

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