Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

**Spin Transfer Torque for Continuously Variable Magnetization** JIANG XIAO, ANDREW ZANGWILL, School of Physics, Georgia Institute of Technology, MARK STILES, National Institute of Standards and Technology — We report quantum and semi-classical calculations of spin current and spin-transfer torque in a free-electron Stoner model for systems where the magnetization varies continuously in one dimension. Analytic results are obtained for an infinite spin spiral and numerical results are obtained for realistic domain wall profiles. The adiabatic limit describes conduction electron spins that follow the sum of the exchange field and an effective field produced by the gradient of the magnetization in the wall. Non-adiabatic effects arise for short domain walls but their magnitude decreases exponentially as the wall width increases. Our results cast doubt on the existence of a non-adiabatic contribution to the spin-transfer torque.

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Date submitted: 22 Nov 2005 Electronic form version 1.4