

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Dynamics of spin flipping LUCIAN COVACI, University of British Columbia, WONKEE KIM, FATIH DOGAN, FRANK MARSIGLIO, University of Alberta — Interactions between a spin polarized current and a ferromagnetic spin chain will lead to the eventual flipping of the spins. We study the dynamics of spin flipping due to Kondo- like interactions between an electron and a spin chain. Interactions within the chain are taken to be of Heisenberg type. The full time dependent quantum mechanical problem is solved within a density matrix formulation. We present the time evolution of the electron wave packet and of the spin expectation values as the electron passes through the chain. The electron transmission probability is calculated as a function of electron momentum and interaction coupling strength. We observe excitations induced by spin transfer and resonant transmission regimes. Deviations from quasi-classical treatments of magnetic moments are discussed.

Lucian Covaci
University of British Columbia

Date submitted: 20 Nov 2006

Electronic form version 1.4