

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

A model for spin sensitive dissipation in atomically resolved probe microscopy experiments on magnetic surfaces GIUSEPPE ERNESTO SANTORO, FRANCO PELLEGRINI, ERIO TOSATTI, SISSA, Trieste — We describe a mechanism of energy dissipation relevant for experiments of single spin manipulation, such as the recently introduced magnetic exchange force microscopy. By considering a driven damped two-state system in the overdamped regime, we show how the spin-phonon coupling in a magnetic system can lead to hysteresis effects and thus to a spin-dependent dissipation channel of relevant magnitude down to low frequencies. We use standard real time path-integral techniques to derive simple rate equations for the spin-boson model that can be numerically integrated to investigate the frequency and temperature dependence of the dissipated energy.

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Date submitted: 19 Nov 2009

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