

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Thermally-Assisted Current-Driven Domain Wall Motion REMBERT DUINE, Utrecht University, ALVARO NUNEZ, Valparaiso, Chile, ALLAN MACDONALD, The University of Texas of Austin — Starting from the stochastic Landau-Lifschitz-Gilbert equation, we derive Langevin equations that describe the nonzero-temperature dynamics of a rigid domain wall. We derive an expression for the average drift velocity of the domain wall $\langle \dot{r}_{\text{dw}} \rangle$ as a function of the applied current, and find qualitative agreement with recent magnetic semiconductor experiments. Our model implies that at any nonzero temperature $\langle \dot{r}_{\text{dw}} \rangle$ initially varies linearly with current, even in the absence of non-adiabatic spin torques.

Rembert Duine
Utrecht University

Date submitted: 25 Nov 2006

Electronic form version 1.4