Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Minimum action paths for single domain ferromagnetic nanostructures under the influence of spin transfer torque GABRIEL CHAVES-O'FLYNN, DANIEL STEIN, ANDREW KENT, ERIC VANDEN-EIJNDEN, New York University — Thermally induced magnetization reversal is an important issue for the design of magnetic storage devices. The problem is usually studied using Kramers' theory of reaction rates, which is applicable when the dynamics can be described as gradient forces. Spin Transfer Torque (STT) is an effect of technological importance which does not fall in this category. For Spin Transfer Torque an action minimization is required to find the most probable paths and transition states between metastable states. We calculate these most probable paths for ferromagnetic nanostructures under the influence of STT in the low noise limit for a variety of current strengths and magnetic fields. Previous action minimization were done in the absence of STT and provide a good basis for comparison [1]. We study thin films with an in-plane easy magnetization axis using the geometrical Minimum Action Method (gMAM) [2]. The action obtained using gMAM is in qualitative agreement with activation energy barriers on previous work by Li-Zhang [3].

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Date submitted: 29 Dec 2010 Electronic form version 1.4