Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Slonczewski windmill with dissipation and asymmetry YAROSLAW BAZALIY, University of South Carolina — J. Slonczewski invented spin-transfer effect in layered systems in 1996. Among his first predictions was the regime of the "windmill motion" of a perfectly symmetric spin valve. In this regime magnetizations of the layers rotate in a fixed plane keeping the angle between them constant. Since "windmill" was predicted to happen in the case of zero magnetic anisotropy, while in most experimental setups the anisotropy is significant, the phenomenon was not a subject of much research. However, the behavior of the magnetically isotropic device is related to the interesting question of current induced ferromagnetism and is worth more attention. Here we study the windmill regime in the presence of dissipation, exchange interaction, and layer asymmetry. It is shown that the windmill rotation is almost always destroyed by those effects, except for a narrow interval of electric current, determined by the parameters of the device.

Yaroslaw Bazaliy
University of South Carolina

Date submitted: 21 Nov 2008 Electronic form version 1.4