Abstract Submitted
for the 4CF06 Meeting of
The American Physical Society

Dynamics of high frequency magnetization reversal in nanomagnets[1] ZHIHUAI ZHU, Laboratory of Solid State Microstructures, Nanjing University, Nanjing 210093, China, PLD LAB IN NANJING UNIVERSITY, CHINA TEAM — The magnetization reversal of two-dimensional nanomagnets driven by high frequency magnetic field is investigated by numerically solving the Landau-Lifshitz-Gilbert equation. It is observed that the hysteresis dispersion, i.e. hysteresis area A as a function of f, exhibits the second resonance once the in-plane effective field is nonzero. The dynamics of this resonance shows some chaotic behaviors, and originates from the transition between the steady state with a small precessional oscillation and a metastable state with a large-angle reversal. Over the high f range, the loop area A for a fixed f oscillates with time t and each component of magnetization shows a periodic maximal reversal. The oscillation of A(t) relates to that coexistences of precessional modes alternately appears in the systemic configuration. Finally, large domains and a size effect on A(t) also are exhibited under a strong exchange interaction.

[1]The Natural Science Foundation of China (50332020, 10021001, 10494037)

Zhihuai Zhu
Laboratory of Solid State Microstructures,
Nanjing University, Nanjing 210093, China

Date submitted: 11 Sep 2006 Electronic form version 1.4