

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Fate of Uniform Ferromagnetism under Spin Current: Domain Nucleation JUNYA SHIBATA¹, RIKEN FRS, 2-1 Hirosawa, Wako, Saitama 351-0198, Japan, GEN TATARA², Graduate School of Science, Osaka University, Toyonaka, Osaka 560-0043, Japan, HIROSHI KOHNO, Graduate School of Engineering Science, Osaka University, Toyonaka, Osaka 560-8531, Japan, YOSHICHIKA OTANI³, Institute for Solid State Physics, University of Tokyo, 5-1-5 Kashiwanoha, Kashiwa, Chiba 277-8581, Japan — A key mechanism of the current-induced magnetization dynamics is the spin torque from a spin polarized current (spin current), which is exerted on spatial gradient of magnetization. Recently, it has been pointed out that a large spin current applied to a uniform ferromagnet leads to a spin-wave instability. In this work, we show that such instability is absent in a state containing a domain wall by evaluating the spin-wave dispersion around it. This may indicate that nucleation of magnetic domains occurs above a certain critical spin current. This scenario is supported by an explicit energy comparison between the uniformly magnetized state and the domain-wall state under spin current.

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Date submitted: 24 Nov 2004

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