

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Switching behaviors of Co nanorings in the current-perpendicular-to-plane configuration

T. YANG, A. HIROHATA, M. HARA, RIKEN, Japan, T. KIMURA, Y. OTANI, University of Tokyo and RIKEN, Japan — We fabricated current-perpendicular-to-plane pseudo-spin-valve (CPP PSV) nanopillars comprising a thick and a thin Co rings with deep submicron lateral sizes. The dc current can effectively induce the flux-closure vortex states in the rings with desired chiralities. Abrupt transitions between the vortex states are also realized by the dc current and detected with the giant magnetoresistance (GMR) effect, which are interesting on such technological applications as magnetic random access memory(MRAM) . Both the Oersted field and the spin-transfer torque are found important to the magnetic transitions. They can be designed to cooperate with each other in the vortex-to-vortex transitions by carefully setting the chirality of the vortex state in the thick Co ring. Detailed results on the magnetic switching behaviors induced by both the DC current and the in-plane external field will be presented.

T. Yang
RIKEN, Japan

Date submitted: 29 Dec 2006

Electronic form version 1.4