

Abstract Submitted  
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**Magnetization reversal process and domain wall resistance in a water drop shape ring** D.C. CHEN, Department of Material Science and Engineering, National Chiao Tung University, D.P. CHIANG, Ming Hsin University of Science and Technology, Y.D. YAO, Institute of Physics, Academia Sinica — Patterned permalloy (Ni80-Fe20) materials have been fabricated by e-beam lithography in the shape of water drop ring. A tip is intentionally added into ring as geometrical defects to interrupt the continuity of magnetization reversal process, in order to create domain wall. Image from Magnetic force microscopy (MFM) with real-time external field confirmed this domain structure. As a result of magneto-resistance (MR) measurement, the ratio of MR is about  $0.137 \sim 0.233\%$  and  $0.23 \sim 0.71\%$  at sweeping angles of samples and sweeping external field, respectively. The ratio of the change in the electric resistance which is measured by I-V curve is just about the value of domain wall MR ratio which is measured by sweeping angles and external field. In summary, we have successfully demonstrated that the domain wall motion along the direction of perimeter in a ferromagnetic ring at its onion state; and the critical field to form onion state is near 200 Oe and the lowest field which can still drag the domain wall is between 100 and 50 Oe.

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