# Distinct Universality Classes of Domain Wall Roughness in Two-Dimensional Pt/Co/Pt Films

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We demonstrate here that the current-driven domain wall (DW) in two dimensions forms a “facet” roughness, distinctive to the conventional self-affine roughness induced by a magnetic field [1]. Despite the different universality classes of these roughnesses, both the current- and field-driven DW speed follow the same creep law only with opposite angular dependences. Such angular dependences result in a stable facet angle, from which a single DW image can unambiguously quantify the spin-transfer torque efficiency, an essential parameter in DW-mediated nanodevices.

## Reference

[1] K.-W. Moon, D.-H. Kim, S.-C. Yoo, C.-G. Cho, S. Hwang, B. Kahng, B.-C. Min, K.-H. Shin, and S.-B. Choe, *Phys. Rev. Lett.* **110**, 107203 (2013).

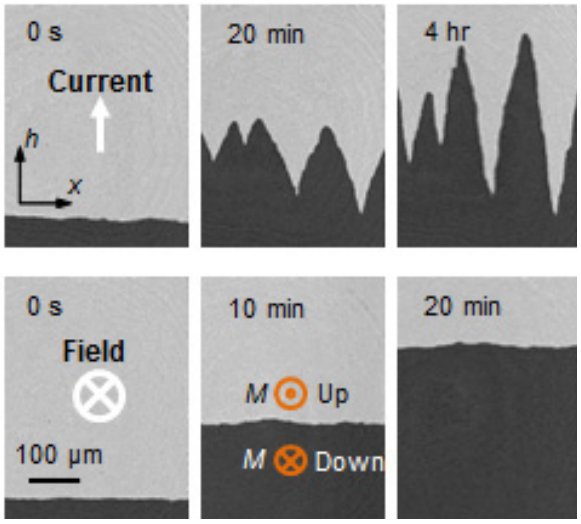


**Fig. 1** (up) Current induced magnetic domain wall motion in the perpendicular magnetic anisotropy film. The domain wall forms the facet roughness and the speed of the wall converge to zero. (down) Field driven wall motion. The wall propagates with almost constant speed.