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Spin transfer induced domain wall motion by perpendicular current injection in MgO-based magnetic tunnel junctions[1] A. CHANTHBOUALA, R. MATSUMOTO, J. GROLLIER, V. CROS, A. ANANE, A. FERT, A. V. KHVALKOVSKIY, Unite Mixte de Physique CNRS/Thales, France, K.A. ZVEZDIN, Istituto P.M., Italy, A. FUKUSHIMA, S. YUASA, National Institute of Advanced Industrial Science and Technology, Japan — The spin transfer effect allows to manipulate magnetic domain walls in ferromagnetic wires by current injection. Most experiments use the lateral configuration in which the current is injected directly through the wire where the domain wall (DW) propagates. In this geometry the critical current densities are of the order of 10^8 A.cm^{-2}. Here we show that by using the current-perpendicular to plane geometry, the current densities can be decreased by two orders of magnitude. Depending of the current sign, the DW propagates in the free layer of a magnetic tunnel junction in both directions, inducing large resistance variations. By investigating the physical origin of DW motion, we find that the field-like torque has a large contribution to the effect, as recently predicted by Khvalkovskiy *et al.* (Phys. Rev. Lett. 2009). This result paves the way towards a new type of domain wall based magnetic memories.

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