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【845】 Zero-field switching of Pt/Co/AlO_x nano-dots induced by inhomogeneous current density

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Current-induced spin-orbit torque switching of perpendicular magnetization requires the application of an external magnetic field collinear with the current to ensure deterministic reversal. Recently, a number of approaches have been proposed to control the magnetization in absence of the field, for example by employing antiferromagnets or introducing lateral structural asymmetries. Here, using scanning x-ray transmission microscopy, we demonstrate deterministic switching of magnetic nano-dots based on non-uniform distribution of the current. The experimental results are supported by micromagnetic simulations which indicate the origin of the field-free reversal in the interplay between the current inhomogeneity as well as the symmetry of the Dzyaloshinskii-Moriya interaction and spin-orbit torques.

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