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【807】 Time- and spatially-resolved magnetization dynamics driven by spin-orbit torques

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Current-induced spin-orbit torques (SOTs) represent one of the most effective ways to manipulate the magnetization in spintronic devices. The orthogonal torque-magnetization geometry and the large domain wall velocities inherent to materials with strong spin-orbit coupling make SOTs appealing for fast switching applications in nonvolatile memory and logic units. Here, we report the first direct observation of SOT-driven magnetization dynamics in Pt/Co/AlO_x dots during current pulse injection. Time-resolved x-ray images with 25 nm spatial and 100 ps temporal resolution reveal that switching is achieved by fast nucleation of an inverted domain at the edge of the dot and propagation of a tilted domain wall across the dot.

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