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Room-temperature spin-orbit torque switching induced by a topological insulator

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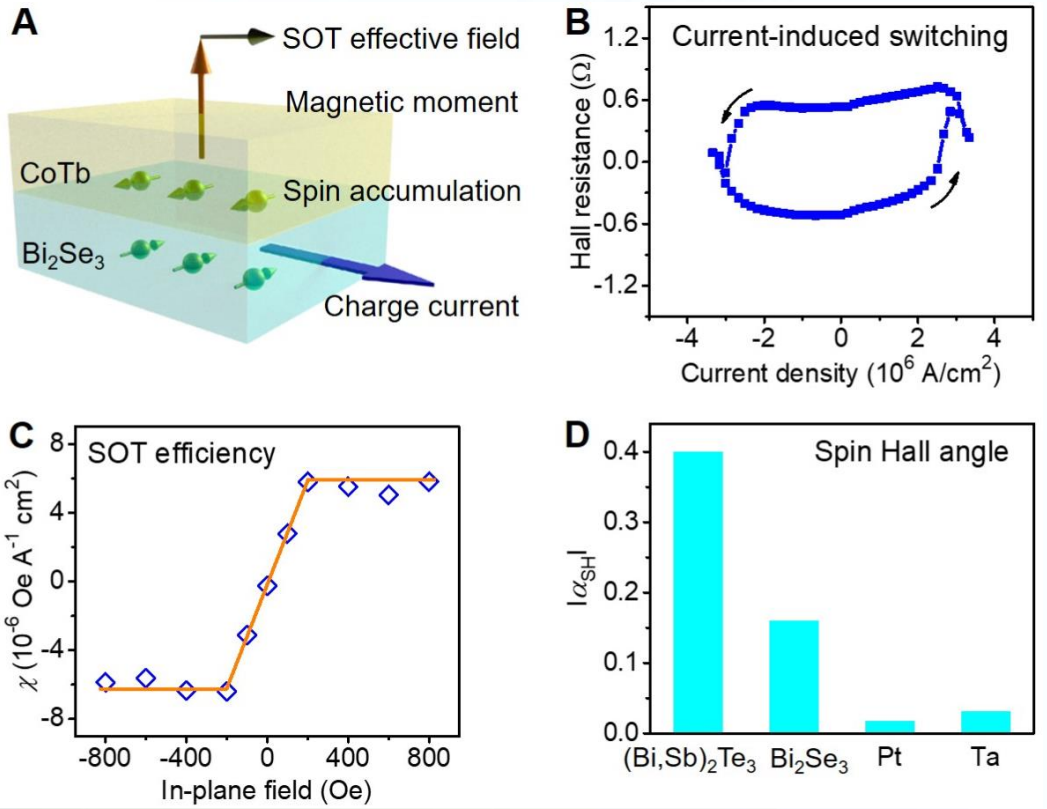
The strongly spin-momentum coupled electronic states in topological insulators (TI) have been extensively pursued to realize efficient magnetic switching. However, previous studies show a large discrepancy of the charge-spin conversion efficiency. Moreover, current-induced magnetic switching with TI can only be observed at cryogenic temperatures. We report spin-orbit torque switching in a TI-ferrimagnet heterostructure with perpendicular magnetic anisotropy at room temperature. The obtained effective spin Hall angle of TI is substantially larger than the previously studied heavy metals. Our results demonstrate robust charge-spin conversion in TI and provide a direct avenue towards applicable TI-based spintronic devices.



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