

Abstract Submitted  
for the MAR17 Meeting of  
The American Physical Society

**Observation of long-lived persistent spin polarization in a topological insulator.** JIFA TIAN, Department of Physics and Astronomy, Purdue University, SEOKMIN HONG, Birck Nanotechnology Center, Purdue University, IRENEUSZ MIOTKOWSKI, Department of Physics and Astronomy, Purdue University, SUPRIYO DATTA, Birck Nanotechnology Center, Purdue University, YONG P. CHEN, Department of Physics and Astronomy, Purdue University — 3D Topological insulators (TI), featuring helically spin-momentum-locked topological surface states (TSS), are considered promising for spintronics applications. Several recent experiments in TIs have demonstrated a current induced electronic spin polarization that may be used for all electrical spin generation and injection. Here, we report spin potentiometric measurements in TIs that have revealed a long-lived persistent electron spin polarization even at zero current. Unaffected by a small bias current and persisting for several days at low temperature, the spin polarization can be induced and reversed by a large “writing” current applied for an extended time. Such an electrically controlled persistent spin polarization with unprecedented long lifetime could enable a rechargeable spin battery and rewritable spin memory for potential applications in spintronics and quantum information.

Jifa Tian  
Purdue Univ

Date submitted: 11 Nov 2016

Electronic form version 1.4