

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Domain wall of a ferromagnet on a three-dimensional topological insulator RYOHEI WAKATSUKI, MOTOHIKO EZAWA, University of Tokyo, NAOTO NAGAOSA, University of Tokyo, RIKEN Center for Emergent Matter Science (CEMS) — Topological insulators (TIs) show rich phenomena and functions which can never be realized in ordinary insulators. Most of them come from peculiar surface or edge states. Especially, the quantized anomalous Hall effect without an external magnetic field is realized in a two-dimensional ferromagnet on a three-dimensional TI, which supports the dissipationless edge current. Here we demonstrate theoretically that the domain wall of this ferromagnet, which carries edge currents, is charged and can be controlled by an external electric field. The chirality and relative stability of the Neel wall and the Bloch wall depend on the position of the Fermi energy as well as the form of the coupling between the magnetic moment and the orbital of the host TI. These findings will pave a path to utilize the magnets on TI for spintronics applications.

R. Wakatsuki, M. Ezawa, and N. Nagaosa, *Scientific Reports* **5**, 13638 (2015).

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Date submitted: 02 Nov 2015

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