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Visualization of chiral edge states in a magnetic topological insulator MONICA ALLEN, Stanford University, YONGTAO CUI, UC Riverside, ERIC YUE MA, Stanford University, MASATAKA MOGI, MINORU KAWAMURA, University of Tokyo, DAVID GOLDHABER-GORDON, Stanford University, YOSHINORI TOKURA, University of Tokyo, ZHI-XUN SHEN, Stanford University — Topological insulators with ferromagnetic ordering exhibit the quantum anomalous Hall effect, in which a chiral one-dimensional edge state encloses an insulating interior. We provide a real-space visualization of the local conductivity profile in Cr modulation doped (Bi,Sb)2Te3 using microwave impedance microscopy (MIM). Well-defined edge states appear in the quantum anomalous Hall regime, which is robust at magnetic fields exceeding the coercive field. Our images reveal a dramatic change in the edge state pattern and microwave response near the topological phase transition between the Chern number N=1 and N=0 states. By mapping the non-monotonic evolution of the complex microwave response in magnetic field, we construct a phase diagram of competing topological states and unveil the microscopic nature of dissipation and conductivity in each regime.

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