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Investigation of Quantum Anomalous Hall Effect in Magnetic Topological Insulators XUFENG KOU, YABIN FAN, LEI PAN, KANG WANG, University of California, Los Angeles, SHIH-TING GUO, WEI-LI LEE, TING-KUO LEE, Academia Sinica, EUN-SANG CHOI, National High Magnetic Field Laboratory, YING JIANG, YONG WANG, Zhejiang University, DEVICE RESEARCH LABORATORY, UCLA TEAM, INSTITUTE OF PHYSICS, ACADEMIA SINICA, TAIPEI COLLABORATION, NATIONAL HIGH MAGNETIC FIELD LABORATORY COLLABORATION, CENTER FOR ELECTRON MICROSCOPY AND STATE KEY LABORATORY OF SILICON MATERIALS, ZHEJIANG UNIVERSITY COLLABORATION — We investigate the quantum anomalous Hall Effect (QAHE) and related chiral transport in the MBE-grown Cr-doped $(BiSb)_2Te_3$ thin films. With high sample quality and robust magnetism at low temperatures, the quantized Hall conductance of e^2/h is realized up to 300 mK. Meanwhile, the Chern insulator-featured chiral edge conduction is manifested by the non-local transport measurements. We find that the QAHE edge transport depends on both the current direction and magnetization, and its chiral feature can be well-described by the Landauer-Büttiker equation. Unlike the helical edge channels in the quantum spin Hall (QSHE) state, the QAHE state is robust against the momentum and energy relaxation, and the dissipationless chiral edge conduction persists on the macroscopic scale. Our results are consistent with the QAHE theory, and the chiral edge channel transport may pave a new way towards ideal low-power interconnect applications.

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