Landau quantization and the thickness limit of topological insulator thin films of \( \text{Sb}_2\text{Te}_3 \) XUCUN MA, YEPEING JIANG, YILIN WANG, Institute of Physics, CAS, MU CHEN, Department of Physics, Tsinghua University, CANLI SONG, ZHI LI, LILI WANG, KE HE, Institute of Physics, CAS, XI CHEN, QI-KUN XUE, Department of Physics, Tsinghua University — We report the experimental observation of Landau quantization of molecular beam epitaxy grown \( \text{Sb}_2\text{Te}_3 \) thin films by a low-temperature scanning tunneling microscope. Different from all the reported systems, the Landau quantization in \( \text{Sb}_2\text{Te}_3 \) topological insulator is not sensitive to the intrinsic substitutional defects in the films. As a result, a nearly perfect linear energy dispersion of surface states as 2D massless Dirac fermion system is observed. We demonstrate that 4 quintuple layers are the thickness limit for \( \text{Sb}_2\text{Te}_3 \) thin film being a 3D topological insulator.

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