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Topological insulator Sb_2Te_3 thin films grown by MBE[1] JIN-FENG JIA, GUANG WANG, XIE-GANG ZHU, YAO-YI LI, JING WEN, Key Lab for Atomic, Molecular and Nanoscience, Department of Physics, Tsinghua University, Beijing 100084, P. R. China, KE HE, LILI WANG, XUCUN MA[2], HAI-JUN ZHANG, ZHONG FANG, Institute of Physics, The Chinese Academy of Sciences, Beijing 100190, P. R. China, QI-KUN XUE, Key Lab for Atomic, Molecular and Nanoscience, Department of Physics, Tsinghua University, Beijing 100084, P. R. China — Atomically flat Sb_2Te_3 thin films were grown by molecular beam epitaxy (MBE) on Si(111) substrate. Layer-by-layer growth was characterized by real time reflection high-energy electron diffraction (RHEED) intensity oscillations. *In situ* angle-resolved photoemission spectroscopy (ARPES) and scanning tunneling microscopy (STM) measurements reveal that the as-grown films are stoichiometric Sb_2Te_3. When the thickness is larger than two quintuple layers, the films show the predicted topological property with a single Dirac-cone on the surface. The measured band structure for the films with a thickness from one to five quintuple layers agrees well with our first principle calculations.

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