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Evidence of the two surface states of $(Bi_{0.53}Sb_{0.47})_2Te_3$ films grown by van der Waals[1] LIANG HE, XUFENG KOU, MURONG LANG, KANG LONG WANG, Dept. of Elec. Eng., UCLA, EUN SANG CHOI, National High Magnetic Field Laboratory, YING JIANG, YONG WANG, Dept. of Mat. Sci. and Eng., Zhejiang University, FAXIAN XIU, Dept. of Phys., Fudan University — The discovery of topological insulators (TIs) has led to numerous exciting opportunities for studying topological states of quantum physics and for exploring spintronic applications due to the new physics arising from their robust metallic surface states. Here, we report the growth of high-quality topological insulator $(Bi_xSb_{1-x})_2Te_3$ thin films using a single van der Waals GaSe buffer layer by molecular beam epitaxy. Ultra-low surface carrier density of 1.3×10^{12} cm^{-2} and a high Hall mobility of 3100 cm^2/Vs have been achieved for $(Bi_{0.53}Sb_{0.47})_2Te_3$. The high-quality films enable us to observe quantum oscillations associated with the top and bottom surface states and to manipulate the Dirac electrons and bulk holes' conduction properties.

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