

Abstract Submitted
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Epitaxial growth of high quality Bi_2Se_3 thin films on CdS XUFENG KOU, LIANG HE, University of California, Los Angeles, FAXIAN XIU, Iowa State University, MURONG LANG, University of California, Los Angeles, YONG WANG, The University of Queensland, ALEXEI FEDEROV, Lawrence Berkeley National Laboratory, XINXIN YU, University of California, Los Angeles, JIN ZOU, The University of Queensland, KANG WANG, University of California, Los Angeles, UNIVERSITY OF CALIFORNIA, LOS ANGELES TEAM, IOWA STATE UNIVERSITY COLLABORATION, THE UNIVERSITY OF QUEENSLAND COLLABORATION, LAWRENCE BERKELEY NATIONAL LABORATORY COLLABORATION — We report the experiment of high quality epitaxial growth of Bi_2Se_3 thin films on lattice-matched hexagonal CdS (0001) substrates using a solid source molecular-beam epitaxy system. Layer-by-layer growth of single crystal Bi_2Se_3 has been observed from the first quintuple layer with larger surface triangular terraces. The improved film quality facilitates the characterization of surface states during magneto-transport measurements, such as high Hall mobility of $\sim 6000 \text{ cm}^2/\text{V}\cdot\text{s}$, a distinct Shubnikov-de Haas (SdH) oscillations and weak anti-localization cusp in the magnetic field dependent longitudinal resistance. These characteristics of Bi_2Se_3 thin films promise a variety of potential applications in ultra-fast, low-power dissipation devices.

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