Abstract Submitted
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**Amplified topological characteristics of MBE-grown Bi2Se3/II-VI semiconductor superlattices**[1] ZHIYI CHEN, LUKAS ZHAO, INNA KORZHOVSKA, MARIA TAMARGO, LIA KRUSIN, City College of New York - CUNY — Access to charge transport in Dirac surface states of topological insulators (TIs) such as $Bi_2Se_3$ is faced with two big challenges: one is significant bulk conduction and another is intermixing of topological states with nontopological 2DEG quantum well states formed by bending of bulk electronic bands near the surface. The latter effect is thought to arise via charge transfer from surface adatoms and, therefore, the choice of layers abutting topological surfaces can be critical. Here we report a successful molecular beam epitaxy growth of $Bi_2Se_3/Zn_xCd_{1-x}Se$ superlattices that improve topological characteristics of individual 8 - 10 nm thick TI layers. We show that in these superlattices the two-dimensional (2D) weak antilocalization quantum correction to classical magnetoresistance, associated with topological Berry phase, scales with the number of TI layers, with one quantum channel per layer. The Berry phase of $\pi$ obtained independently from Shubnikov de Haas quantum oscillations demonstrates robust topological interfaces in the multilayer structure.

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