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Quantum oscillations in metallic Sb_2Te_2Se topological insulator KESHAV SHRESTHA, Idaho National Laboratory, VERA MARINOVA, Institute of Optical Materials and Technology, Bulgarian Academy of Science, DAVID GRAF, National High Magnetic Field Laboratory Tallahassee, BERND LORENZ, CHING WU CHU[1], TCSUH and Department of Physics, University of Houston — We have studied the magnetotransport properties of the metallic, p-type Sb_2Te_2Se which is a topological insulator. Magnetoresistance shows Shubnikov de Haas oscillations in fields above B=15 T. The maxima/minima positions of oscillations measured at different tilt angles with respect to the B direction align with the normal component of field $B\cos\theta$, implying the existence of a 2D Fermi surface in Sb_2Te_2Se. The value of the Berry phase β =0.43, determined from a Landau level fan diagram, further suggests that the oscillations result from topological surface states. From Lifshitz-Kosevich analyses, the position of the Fermi level is found to be E_F =250 meV, above the Dirac point. This value of E_F is almost 3 times as large as that in our previous study on the $Bi_2Se_{2.1}Te_{0.9}$ topological insulator; however, it still touches the tip of the bulk valence band. This explains the metallic behavior and hole-like bulk charge carriers in the Sb_2Te_2Se compound.

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