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Weak Antilocalization Effect in Metallic Bi_2Te_3 Topological Insulator K. SHRESTHA, TcSUH and Department of Physics, University of Houston, 3201 Cullen Blvd., Houston, Texas 77204, USA, M. CHOU, Department of Materials and Optoelectronic Science, National Sun Yat-Sen University, Taiwan, D. GRAF, National High Magnetic Field Laboratory, Florida State University, Tallahassee, FL 32310, USA, H. D. YANG, Department of Physics, National Sun Yat-Sen University, Taiwan, B. LORENZ, PAUL C. W. CHU[1], TcSUH and Department of Physics, University of Houston, 3201 Cullen Blvd., Houston, Texas 77204, USA — We have observed weak antilocalization effect in the metallic Bi_2Te_3 single crystals having different bulk carrier densities. The angle dependence of weak antilocalization with respect to the direction of the magnetic field showed the surface states dominating in the samples having lower carrier concentration. The surface states dominance in weak antilocalization does not depend on the nature of the bulk charge carriers (p or n-type). Using the Hikami-Larkin-Nagaoka (HLN) formula, we have found the number of conduction channels is smaller in the samples having lower carrier concentration.

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