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Magnetotransport measurements on Mn-doped Bi₂Se₃ Thin Films¹ SERCAN BABAKIRAY, TRENT JOHNSON, PAVEL BORISOV, DAVID LEDERMAN, West Virginia University — The intrinsic n type conductivity of bulk topological insulator Bi₂Se₃ was compensated with Mn dopant to increase the resistivity. In addition, the magnetic character of Mn ions causes a gap opening of the corresponding Dirac cone surface states. We investigated the effect of the Mn on crystal structure as well as the transport and magnetic properties of Bi_{2-x}Mn_xSe₃ thin films grown by molecular beam epitaxy on Al₂O₃ (0001) substrates. Characteristic features in the form of the Kondo effect and weak anti-localization were observed at different Mn concentrations up to temperatures of 50 K accompanied by enhanced resistance and reduced carrier mobility. The phase coherence length of the two-dimensional sheet conductance decreased with increasing Mn-concentration, however the protected surface states were still present up to x=0.063.

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