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Low frequency noise in exfoliated $Bi_{1.5}Sb_{0.4}Te_{1.7}Se_{1.3}$ field effect devices MITALI BANERJEE, SEMONTI BHATTACHARYYA, HARIHARAN N, SUJA ELIZABETH, ARINDAM GHOSH, Department of Physics, Indian Institute of Science, Bangalore 560012, DEPARTMENT OF PHYSICS, INDIAN INSTITUTE OF SCIENCE, BANGALORE 560012 TEAM — Topological insulators are a new class of materials which have emerged as the new paradigm to study the exotic topological phases of matter. Electron transport is studied for field effect devices of $Bi_{1.5}Sb_{0.4}Te_{1.7}Se_{1.3}$ thin films, mechanically exfoliated on Si/SiO_2 substrates. The resistivity initially decreases with decreasing temperature indicating metallic-like behavior. However the resistivity shows an upturn below 13K which can be associated with the weak localization effect. The resistivity as a function of gate voltage shows hysteresis at low carrier densities and is independent of different sweep rates of the gate voltages. In addition to resistivity measurements, we have investigated low frequency noise or "1/f" noise as a function of temperature and gate voltage. The magnitude of 1/f noise increases at lower temperatures and with decreasing carrier densities. At lower carrier densities just like resistivity, noise is also saturated indicating long range disorder in the systems due to selenium vacancies. [1] M. Z. Hasan and C. L. Kane, Rev. Mod. Phys. 82, 3045 (2010) [2] E. Rossi, J. H. Bardarson, M. S. Fuhrer, and S. Das Sarma, Phys. Rev. Lett. 109, 096801 (2012)

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