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Megnetoresistance in thin Bi2Te3 layers contacted by Indium (In) superconducting electrodes ZHUO WANG, RAMESH MANI, Georgia State University — Topological Insulators (TIs) are materials that insulate in the bulk but conduct electricity on their surfaces, which topologically protected by time-reversal symmetry. Transport measurements of topological insulators in the proximity of a superconductor are theoretically predicted to be a significant method to detect Majorana Fermions. Our experiment studied the interplay between superconductivity and TI surface states below the critical temperature of a type-I superconductor. Here, we used the four terminal lock-in technique to study the transport properties of Bi2Te3 specimens contacted by Indium superconducting electrodes, while sweeping perpendicular magnetic field, at $T < 4.2$ K. The results indicate a sharp suppression of the longitudinal resistance at weak magnetic fields, below the critical temperature of Indium. What's more exciting is that the interaction between superconductivity and TI surface states induces resistance enhancement at $T \leq 2.8$K, well below the critical temperature of Indium, in the absence of a magnetic field.

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