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Electrostatically Tuned Superconductor-Insulator Transition in Indium Oxide Thin Films[1] QI YANG, Stanford Univ, ALEXANDER PALEVSKI, Tel Aviv University, Israel, AHARON KAPITULNIK, Stanford Univ — Recently the "standard paradigm" which assumes that in the presence of disorder, and in the limit of zero temperature, the two-dimensional (2D) electron may exhibit either an insulating or a superconducting ground state, has been challenged both, theoretically and experimentally. In this paper we study amorphous Indium Oxide (InO_x) thin films that are fabricated by electron beam evaporation on $SrTiO_3$. By annealing in vacuum, air or oxygen atmosphere the room temperature sheet resistance of the samples is varied. Applying an external electrostatic field (using back-gating) and magnetic fields at low temperatures, the samples are tuned, between a superconducting and an insulating states. Sheet resistance and Hall effect are measured at low temperatures gaining further insights into the superconductor-metal-insulator transitions (SIT) in this system.

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