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Indirect Magnetic-Field-Tuned Superconductor-Insulator Transitions of Quasi-Two Dimensional Metal Films[1] YEN-HSIANG LIN, ALLEN GOLDMAN, University of MInnesota — Homogeneous films of amorphous bismuth have been continuously tuned from the superconducting state by increasing a perpendicular magnetic field. Electrical transport and Hall measurements show that the non-superconducting states of the films are quantum-corrected metals. In the vicinity of transition field, the resistance can be scaled with critical exponent product νz=0.4 at high temperatures but this form fails at lower temperatures where the resistance is a non-monotonic function of temperature. This suggests that a two-phase regime develops near criticality and the transition becomes indirect from superconductor to insulator with this two-phase regime in between at nonzero temperature. We also compare the magnitoresistance of homogeneous and granular bismuth films.

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