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Quantum critical behavior on mesoscopic length scales across the superconductor-insulator transition MIN-SOO KIM, TAILUNG WU, G. SAMBANDAMURTHY, Department of Physics, University at Buffalo-SUNY, Buffalo, NY 14260 — Recent studies of superconductor-insulator transition in 2D films provided new and exciting results, especially the novel transport behavior found on the insulating side of the transition. Here we present results from a study on the magnetic field tuned transition in 2D films when the length and width of the samples are varied from mm to sub-μm scales. Films of amorphous indium oxide are patterned into Hall bars of different sizes using standard optical and electron beam lithography and low temperature/high magnetic field transport measurements are conducted. We find that the low temperature transport behavior of the samples, on either side of the transition, depend systematically on the physical dimensions of the Hall bars and the application of perpendicular magnetic field appears to enhance this dimensional dependence.

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