

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Transport Properties of Amorphous Tantalum Thin Films Near the Superconductor-Insulator Transition YONGGUANG QIN, BRIAN GROSS, JONGSOO YOON, Physics, University of Virginia — In amorphous superconducting thin films, the superconducting transition temperature continuously decreases with decreasing film thickness, and eventually the film becomes an insulator. This is known as the superconductor-insulator transition (SIT). Because the SIT is a phase transition between two different zero temperature ground state, it is an example of quantum phase transition. We observe such a SIT in amorphous tantalum thin films occurring at a sheet resistance of $\sim h^2/2e$ when the film thickness is $\sim 1nm$. We report detailed study on the transport characteristics of amorphous tantalum films at the vicinity of the superconductor-insulator transition.

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Date submitted: 04 Dec 2004

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