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**Drag resistance in bilayer disordered superconducting thin films**

YUE ZOU, GIL REFAEL, Department of Physics, California Institute of Technology, JONGSOO YOON, Department of Physics, University of Virginia — Highly disordered superconducting thin films exhibit a variety of novel phenomena, such as a possible metallic phase intervening the superconducting and the insulating state, and a huge peak in the magnetoresistance curve. Different theories have been proposed, including the quantum-vortex theory, the percolation picture of superconducting islands embedded in a normal metal, and the Bose metal theory. We propose that a drag resistance measurement in a bilayer setup would easily be able to determine which of the models applies. In such an experiment, two thin film superconductors are fabricated parallel to each other, separated by a thin insulator. A current bias is applied in one layer, and a voltage appears in the other due to the interaction between vortices (as in a Giaever transformer), or charge carriers (e.g., Coulomb drag), in different layers. Our calculation of the drag resistance in the various pictures will be discussed.

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