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Bose Metal Phase from Inhomogeneous Flow GERGELY ZIMANYI, Physics Department, UC Davis, NIELS JENSEN, Department of Applied Science, UC Davis — Numerous experiments report a Bose Metal phase between the Superconducting (S) and the Insulating (I) phases at an SI transition. [1,2] However, theoretically the origin of the corresponding dissipation remains unclear. We propose a picture in which inhomogeneous superconducting flow occurs in channels/filaments, defined by islands of localized Bose Glass. The superconducting bosons interact with the localized bosons of the Bose Glass via the Coulomb interaction. This Coulomb drag generates an effective dissipation for the superflow. We developed a new numerical technique to simulate superconductivity by inertial dynamics and a current generator. We found a Bose Metal phase in a finite range of the disorder, bracketed by the superconducting and insulating phases. The noise spectrum was also determined and compared to recent experiments.

[1] H.M. Jaeger, D.B. Haviland, B.G. Orr and A.M. Goldman, Phys. Rev. B 40, 182 (1989).
[2] A. Yazdani and A. Kapitulnik, Phys. Rev. Lett. 74, 3037 (1995); M. Steiner, N. Breznay and A. Kapitulnik, arxiv: 0710.1822.

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