

Abstract Submitted  
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**Dissipation of mobile vortices in self-dual Josephson junction arrays** SAID SAKHI, American University of Sharjah — Mutual  $U(1) \times U(1)$  Chern-Simons Landau-Ginzburg theory appears as an effective field theory in self-dual Josephson junction arrays. In this theory two complex fields associated with disordering electric and magnetic charges are minimally coupled to two gauge fields related to the currents of Cooper pairs and vortices. The condensation of disorder fields is employed to explore the various phases (superconducting, insulating, and metallic) of the model. In this work we investigate the interplay between the dissipation of mobile vortices and the condensation of magnetic and charge excitations. We evaluate the electromagnetic response functions of the system, and we analyze the longitudinal and the Hall conductivities as a function of the strength of dissipation.

Said Sakhi  
American University of Sharjah

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