

Abstract Submitted
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Effects of topological excitations in Josephson junction arrays.

SAID SAKHI, American University of Sharjah — We study the zero-temperature physics of planar Josephson junction arrays in the self-dual approximation in the presence of external offset charges and magnetic fluxes. We introduce a new Landau-Ginzburg formulation to describe both types of topological excitations (electric and magnetic) that determine the quantum phase structure of the model. Through the condensation of the boson fields, this approach captures with ease various phases of Josephson junction arrays including the superconducting phase, the insulating phase, in addition to a novel quantum Hall phase that results from the condensation of composites formed by electric and magnetic topological excitations.

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