

Abstract Submitted
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Critical liquid phases for frustrated bosons in two dimensions

OLEXEI MOTRUNICH, California Institute of Technology, MATTHEW P.A. FISHER, Microsoft Corporation, Station Q, University of California Santa Barbara — An interesting question in strongly correlated systems is the possibility of a “metallic” bosonic liquid – a quantum liquid phase of bosons that is neither superfluid nor Mott insulator. We present an attempt to construct such states using slave particle technique borrowed from theories of spin liquids; the approach can be also loosely viewed as a flux attachment treatment performed in the absence of time reversal breaking. We describe properties of thus constructed boson liquid states, which support gapless boson excitations residing on “Bose surfaces” in the momentum space and exhibit power law correlations in various properties. We also suggest a promising model Hamiltonian of hard-core bosons hopping on a square lattice and with frustrating ring exchanges which may have such a phase.

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