

Abstract Submitted
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Charge degrees of freedom in frustrated lattices JOSEPH BETOURAS, Lorentz Institute, University of Leiden, FRANK POLLMAN, Max Planck Institute for Physics of Complex Systems, Dresden, Germany, KIRILL SHTENGEL, Department of Physics, University of California Riverside, PETER FULDE, Max Planck Institute for Physics of Complex Systems, Dresden, Germany — We explore systematically the charge degrees of freedom in frustrated lattices. A model of spinless fermions on a checkerboard lattice with nearest-neighbor hopping t and Coulomb repulsion V is used at half and quarter fillings. Quantum fluctuations reduce the classical macroscopic degeneracy. For the strongly correlated limit $V \gg t$, an added electron decays into two quasiparticles with fractional charge. We study the classical correlations and, by means of quantum field theory as well as exact diagonalisation, we also investigate the possibility of a confined or deconfined phase as well as the statistics of these quasiparticles.

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