

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Fractionalization and topological point defects in the charge-ordered kagome lattice¹ ANDREAS RUEGG, GREGORY A. FIETE, The University of Texas at Austin — The charge-ordered state on the kagome lattice shows some features which are closely related to two-dimensional topological insulators. This motivated us to study a two-dimensional system of spin-polarized fermions on the kagome lattice at filling fraction $f = 1/3$ interacting through a nearest-neighbor interaction V using the unrestricted mean-field approach. Above a critical interaction strength V_c , a charge-density wave is stabilized. We find that topological point defects in the charge order bind a fractional charge. The value of the bound charge is $1/2$ as long as an effective sublattice symmetry is preserved but changes continuously with the strength of the symmetry-breaking field. Moreover, we compute the confinement potential between two fractionally charged defects and argue that the polaron state, formed upon doping the charge-density wave, can be viewed as a bound state of two defects.

¹Funding: ARO W911NF-09-1-0527

Andreas Ruegg
The University of Texas at Austin

Date submitted: 18 Nov 2010

Electronic form version 1.4