

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Microscopic study of the composite Fermi liquid¹ SCOTT GERAEDTS, JIE WANG, F. D. M. HALDANE, Princeton University — We use exact diagonalization (ED) to study a many-body generalization of the k -space Berry phase for taking a quasiparticle around the Fermi surface of a $\nu = 1/2$ composite Fermi liquid (CFL). Composite fermion “occupations” are identified by a large overlap between the ED state and an explicit model CFL wavefunction. This model wavefunction is found to be very accurate, and also nearly particle-hole symmetric, when the composite fermion quasiparticles are clustered to form a compact Fermi sea. For a sequence of occupation configurations where excitations stay close to the Fermi surface, we find a net phase of π , consistent with an anomalous Hall effect with $\sigma^{xy} = 1/2(e^2/h)$ and with a recent Dirac fermion effective theory.

¹This research was supported by Department of Energy Office of Basic Energy Sciences through Grant No. DE-SC0002140

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Date submitted: 11 Nov 2016

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