Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Fractional quantum Hall droplet on a lattice MARTIN CLAASSEN, Department of Applied Physics, Stanford University, THOMAS DEVEREAUX, Stanford Institute for Materials and Energy Sciences — In analogy to the fractional quantum Hall (FQH) liquid on a disk, we study droplets of interacting electrons in a fractional Chern insulator, in a dispersionless band with non-zero Chern number $\mathcal{C}$. We describe how the quantum geometry of such a band naturally defines a basis of momentum-space Landau levels, with radially-localized wave functions that preserve lattice rotational symmetries, in direct analogy to the lowest Landau level in the continuum. This new approach permits a direct description of the interacting droplet in terms of Haldane pseudopotentials on the disk. We then provide numerical results for the formation of a FQH liquid. We deform the host lattice model via local adiabatic modifications to ideal models with flat Berry curvature and analyze the ground state wavefunction. For $\mathcal{C} > 1$, we discuss generalizations of the FQH droplet as multicomponent FQH systems.

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Date submitted: 15 Nov 2013 Electronic form version 1.4