

Abstract Submitted
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Broken translation symmetry in the half-filled lowest Landau level PRASHANT KUMAR, SRINIVAS RAGHU, Stanford Univ — We present a Hartree-Fock theory of electrons in a half-filled lowest Landau level interacting with Coulomb forces. With the assumptions of a gapless Fermi sea and particle-hole symmetry, we find a charge density wave state in the form of a square crystal. The Fermi sea wavefunction is built from a Slater determinant of single particle wavefunctions that reside strictly within the lowest Landau level. It possesses a π Berry phase upon encircling the Fermi surface. Furthermore, the deviations from a half-filled Landau level in our theory produce cyclotron orbits that are sensitive to the effective magnetic field rather than the absolute value of the field. We discuss the relevance of our theory to the phenomenology of the half-filled Landau level.

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