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Title: Bi-partite composite fermion model for the 5/2 fractional quantum Hall state

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The family of incompressible quantum liquids formed by the interacting two-dimensional electrons in high magnetic fields at the particular fractional occupations of the lowest Landau level are well understood in terms of non-interacting ?composite fermions? ? the topological bound states of electric charge and magnetic flux. The half-filled second Landau level is believed to realize a different quantum liquid called a Pfaffian. This correlated many-body state attracts great interest for its non-Abelian quasiparticle statistics and the anticipated implications for topological quantum computation. Its conventional interpretation involves the formation of a paired composite fermion (CF) superfluid, which is driven by a residual CF-CF attraction under the conditions of an effectively closed cyclotron gap. A different, recently developed model employs division of free composite fermions into multiple partitions, in which they separately fill their respective Landau levels. Its ability to capture the defining properties of the Pfaffian phase (including topological degeneracy of multi-quasiparticle configurations ? an essential requirement for non-Abelian braid statistics) in a particularly intuitive way calls for convincing tests of the underlying wave functions. This is done by means of configuration interaction calculations for cleverly designed N-electron systems in closed geometries, capable of representing an extended experimental sample while remaining computationally feasible. Such numerical tests of the composite fermion models will be the main subject of this talk.