

Poster-1-7

Possible restoration of particle-hole symmetry in the $5/2$ Quantized Hall State at small magnetic fieldLoïc Herviou and Frédéric Mila*Institute of Physics, École Polytechnique Fédérale de Lausanne (EPFL), CH-1015 Lausanne, Switzerland*

Pushing the expansion of the effective Hamiltonian of the $5/2$ quantized Hall state to third-order in the Landau level mixing parameter, we show that the splitting between the pfaffian and the anti-pfaffian induced at second-order is reduced by third-order corrections and disappears at intermediate, experimentally relevant mixing. Furthermore, we argue that the finite-size spectrum is typical of a quantum phase transition, with a strong reduction of the energy gap and level crossings between excited states. We suggest that the phase beyond this quantum critical point, which is inaccessible to the perturbation theory might have an emergent particle-hole symmetry and explain the measured $5/2$ thermal conductance of the $5/2$ quantized Hall state.