Abstract

Condensed Matter

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Stability of the Laughlin phase in presence of interactions

Joint with Nicolas Rougerie

The Laughlin wave function is at the basis of the description of the fractional quantum Hall effect, nevertheless, many of its fundamental properties are yet to be understood. I will present a model for its response, within Laughlin's ansatz, to variations of the external potential and of the interaction among particles.

Our main result is that the energy is asymptotically captured by the minimum of an effective functional with variational constraints fixed by the incompressibility of the Laughlin phase. Moreover, as was already known for the Laughlin wave-function, the one-body density converges to the characteristic function of a set.