On the modeling and simulation of anyons systems

Romain Duboscq *

Christophe.Besse@math.univ-toulouse.fr

In this talk, i will present a model for a 2D system of quantum particles. It turns out that such system can be described by using a peculiar type of quantum statistic: the anyons. In order to describe such systems in a mathematical framework, we introduce the so-called « bosonic » anyons and, in the mean field regime, derive a Gross-Piteavskii energy with a nonlinear magnetic potential. This type of energy being rather stiff due to the nonlinear magnetic potential, we use advanced numerical methods in order to compute stationary states for this kind of systems. These numerical experiments enable us to recover theoretical results.

This is a joint work with Michele Correggi, Douglas Lundholm and Nicolas Rougerie.

*Institut de Mathématiques de Toulouse, Université Paul Sabatier, 118, route de Narbonne, F-31062 Toulouse Cedex 9, FRANCE