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Seminaires du LPTM , Universite de Cergy Pontoise

Jeudi 11 Octobre 2018, 14 :00
LPTM, 4.13 St Martin II
Domaines : cond-mat

Titre : *Floating phase versus chiral transition in a 1D constrained model of quantum dimers, quantum loops and hard-bosons*

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Résumé : *Motivated by the presence of Ising transitions that take place entirely in the singlet sector of frustrated spin-1/2 ladders and spin-1 chains, we study two types of effective dimer models on ladders, a quantum dimer model and a quantum loop model [1]. First of all, we show that both models can be mapped rigorously onto a hard-boson model proposed by Fendley, Sengupta and Sachdev [2] in the context of cold atoms. Then, building on a density-matrix renormalization group algorithm that takes full advantage of the constraints, we perform simulations on clusters with up to 9'000 sites and discuss the full phase diagram of these models, with special emphasis on the nature of the phase transition between the period-three charge-density wave and the disordered phase [3]. On the basis of results of unprecedented accuracy for the correlation length and the wave-vector of the incommensurate short-range correlations, we provide strong numerical evidence that there is an intermediate floating phase far enough from the integrable Potts point, while in its vicinity the numerical data are consistent with a unique transition in the Huse-Fisher chiral universality class [4].*

[1] N. Chepiga and F. Mila, arXiv :1809.00746.
[2] P. Fendley, K. Sengupta and S. Sachdev, Phys. Rev. B 69, 075106 (2004).
[3] N. Chepiga and F. Mila, arXiv :1808.08990.
[4] D. Huse and M. Fisher, Phys. Rev. Lett. 49, 793 (1982).