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Seminaires du LPTM , Universite de Cergy Pontoise

Mardi 9 Fevrier 2016, 11 :00
LPTM, 4.13 St Martin II
Domaines : math-ph

Titre : *Correlation functions of integrable quantum spin chains*

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Résumé : *Integrable systems like the spin-1/2 Heisenberg chain provide the rare opportunity of calculating exact results like energies and thermodynamics for finite size and in the thermodynamic limit. We know many integrable systems for many decades, but actual calculations of physical properties have only rather recently been done if at all.*

A notorious problem is posed by the computation of correlation functions. For the infinite volume system, even static correlators present a major challenge. Currently, we know how to calculate short range correlators for the spin-1/2 Heisenberg chain at arbitrary temperature and magnetic field, where the first results for zero temperature and zero magnetic field have been obtained about 20 years ago. A central result of Jimbo, Miwa, Smirnov and others is the factorization of general static correlators into sums over products of nearest-neighbour correlators similar to the Wick theorem for ideal quantum systems however with much more complicated structure factors.

There are applications in the field of non-equilibrium systems such as interaction quenches. I will talk about applications of the computational methods for the study of the stationary state approached through the equilibration process. A major subject of my talk will be the generalization of the study of correlation functions in direction of higher spin-S chains with su(2) symmetry and into the direction of higher rank symmetry like su(3).