Atelier
« Au-delà de l'intégrabilité : les mathématiques et la physique de l'intégrabilité et sa brisure dans les phénomènes quantiques à basses dimensions fortement corrélés »
13-17 juillet 2015

Workshop
"Beyond integrability: The mathematics and physics of integrability and its breaking in low-dimensional strongly correlated quantum phenomena"
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Dynamics of interacting quantum systems: Effects of symmetries, perturbation strength, and initial states

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We study the evolution of an isolated one-dimensional spin-1/2 system after an abrupt perturbation. Our focus is on the probability for finding the initial state later in time, the so-called survival probability. This quantity corresponds to the Fourier transform of the distribution in energy of the overlaps of the initial state with the eigenstates of the Hamiltonian. The shape of this distribution determines the short-time behavior of the survival probability, which may be exponential, Gaussian, and even faster than Gaussian. The long-time dynamics depends on the filling of the distribution. With strong disorder, the distribution is fragmented and a powerlaw decay emerges. In the clean scenario, we also explore the effects that the additional symmetries of the XXZ model at roots of unity have on its spectrum and dynamics.

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