

Workshop on Integrability



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Riemann surfaces for the totally asymmetric exclusion process with open boundaries

Tuesday, 29 March 2022 11:30 (30 minutes)

The totally asymmetric exclusion process (TASEP) is a continuous time Markov process much studied in statistical physics featuring particles with hard-core interaction hopping randomly on a one-dimensional lattice. This talk will focus on the study of the fluctuations of the particle current in the TASEP with open boundaries in the thermodynamic limit. More precisely, the eigenvalues of a deformation of the Markov matrix of the process, connected to the cumulant generating function of the current, are computed in two different ways. The first excited states are recovered from the ground state eigenvalue (obtained by matrix product ansatz) by analytic continuation. They are then compared with the asymptotics of the Bethe ansatz equations. The eigenstates are put in correspondence with the sheets of a Riemann surface, which is the maximal domain of definition of the analytic continuation of the ground states. Connections are made with KPZ universality and previous results on the TASEP with periodic boundary conditions.

This work was done in collaboration with Sylvain Prolhac (LPT Toulouse)

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Track Classification: Participants Talks: Abstracts of Participants Talks