Multi species asymmetric simple exclusion process with impurity activated flips

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日程 ： 7 月 26 日（火）17：00-18：00

場所 ： Zoom*

概　要

The asymmetric simple exclusion process (ASEP) is broadly regarded as a paradigmatic model for non-equilibrium transport processes. The ASEP and its variations have been instrumental in understanding the mathematical structures and physical characteristics of generic non-equilibrium steady states and dynamics. We present an exact matrix product steady state for a class of multi species asymmetric simple exclusion process with impurities, under periodic boundary condition. Alongside the usual hopping dynamics, an additional flip dynamics is activated only in the presence of impurities. Although the microscopic dynamics renders the system to be non-ergodic, exact analytical results for observables are obtained in steady states for a specific class of initial configurations. Interesting physical features including negative differential mobility and transition of correlations from negative to positive with changing vacancy density, have been observed. We illustrate plausible connections of this exactly solvable disordered system with multi lane asymmetric simple exclusion processes as well as enzymatic chemical reactions. We would briefly discuss some ongoing work on counter-flow induced clustering phenomenon using analytical results in this model.

* 本 ZOOM セミナーに参加されます場合には、事前に下記より登録を済ませてください。

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