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Joint Fluctuations for Occupation Time and Current in the SSEP

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Abstract

We consider the classical symmetric exclusion process in the integers, where one particle is allowed per site at most. At an exponential rate equal to one, the occupation values of any two neighbor sites are exchanged. The equilibrium occupation time fluctuations and the nonequilibrium current fluctuations in the SSEP have been studied separately in the literature. In this joint work with Tiecheng Xu and Dirk Erhard, we investigate the non-equilibrium fluctuations of the pair occupation time/current. As a curious corollary, despite the current being negatively correlated and the occupation time being positively correlated, their limiting fluctuations are independent in the equilibrium.