Current fluctuations in the exclusion process

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Résumé

The asymmetric simple exclusion process is a model used as a template to study various aspects of non-equilibrium statistical physics. It appears as a building block in more realistic descriptions for low-dimensional transport with constraints. In the steady state, a non-vanishing current is carried through the system. The statistical properties of this current are archetypal observables for non-equilibrium behaviour. It this talk, we explain how to derive the full statistics of the current in the ASEP. We present exact combinatorial formulas valid for all system sizes and all values of the system parameters. Our results are obtained using integrability techniques borrowed from the theory of quantum integrable systems such as the Bethe Ansatz and the Matrix Product Representation.

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