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Topic: Non-equilibrium Statistical Physics Preference: Oral

Multiple-transit paths and density correlation functions in PASEP

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We consider the partially asymmetric simple exclusion process (PASEP) when its steady-state probability distribution function can be written in terms of a linear superposition of product measures with a finite number of shocks [1]. In this case the PASEP can be mapped into an equilibrium walk model, defined on a diagonally rotated square lattice, in which each path of the walk model has several transits with the horizontal axis [2, 3]. We particularly show that the multiple-point density correlation function in the PASEP is related to the probability that a path has multiple contacts with the horizontal axis from the above or below.

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[1] V. Belitsky and G. M. Schütz, *El. J. Prob.* **7** Paper No.11 1 (2002).

[2] R. Brak and J. W. Essam, *J. Phys. A: Math. Gen.* **37** 4183 (2004).

[3] R. Brak, J. de Gier and V. Rittenberg, *J. Phys. A* **37** 4303 (2004).