

**Abstract for GR-TR Conference on Statistical Mechanics
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Topic: Non-equilibrium Statistical Physics

Preference: Poster

**Discrete-time analysis of traveling wave solutions and
steady-state of PASEP with open boundaries**

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We consider the dynamics of a single shock in Partially Asymmetric Simple Exclusion Process (PASEP) on a finite lattice with open boundaries under sublattice-parallel updating scheme. We then construct the steady-state of the system by considering a linear superposition of these shocks. It is shown that this steady-state can be also written in terms of a product of four non-commuting matrices. The main result obtained is that these matrices have exactly the general structure of the matrices first introduced in [1] when the steady-state of a one-dimensional driven-diffusive system can be written as a linear superposition of product shock measures. It is easy now to explain the two-dimensional matrix representation of the PASEP with parallel dynamics introduced in [2].

[1] F. H. Jafarpour and S. R. Masharian, *Phys. Rev. E* **79**, 051124 (2009).

[2] A. Honecker and I. Peschel, *J. Statist. Phys.* **88**, 319 (1997).