

Balázs, Márton

Microscopic shape of shocks in a domain growth model. (English) Zbl 1017.82035
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Summary: Considering the hydrodynamical limit of some interacting particle systems leads to hyperbolic differential equation for the conserved quantities, e.g., the inviscid Burgers equation for the simple exclusion process. The physical solutions of these partial differential equations develop discontinuities, called shocks. The microscopic structure of these shocks is of much interest and far from being well understood. We introduce a domain growth model in which we find a stationary (in time) product measure for the model, as seen from a defect tracer or second class particle, traveling with the shock. We also show that under some natural assumptions valid for a wider class of domain growth models, no other model has stationary product measure as seen from the moving defect tracer.

MSC:

82C22 Interacting particle systems in time-dependent statistical mechanics

60K35 Interacting random processes; statistical mechanics type models; percolation theory

Cited in **2** Reviews
Cited in **4** Documents

Keywords:

hydrodynamical limit; interacting particle systems; hyperbolic differential equation; conserved quantities; inviscid Burgers equation; simple exclusion process; shocks; domain growth model

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