

Shock formation in the periodic exclusion process with asymmetric coupling

Qing-Song Wu, University of China

This paper studies a periodic asymmetric exclusion process composed of two equal parts. Particles are allowed to jump between these two parts. Shock formation has been revealed when the lane changing rates are asymmetric, in both strong and weak coupling situations. The density profiles and phase structure of the model are analyzed. Mean field analysis has been carried out and it is in agreement with the Monte Carlo simulations. The results have been compared with those arising from open boundaries and the differences are indicated and explained.