Dynamical Phase Transition of the Hydrodynamic Behavior of Slowed Symmetric Exclusion

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Abstract:
We consider one-dimensional symmetric simple exclusion processes with one bond whose dynamics is slowed down in order to difficult the passage of particles across it. Microscopically, the rate of passage at the slow bonds is given by $aN^{-\beta}$, where N is the parameter of scale. We study the influence of the rate of passage of mass at those bonds on the corresponding macroscopic hydrodynamic equation. We prove that, depending on the range of the parameter β, these processes exhibit a dynamical phase transition that goes from smooth profiles to the development of discontinuities.