Boundary-driven hydrodynamics for ASEP in one space dimension

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The entropy solution to a non-linear transport equation on bounded domain presents discontinuities at the boundaries (the boundary layers).

In this talk, we aim at giving a microscopic description of these specific boundary behaviours.

We consider the asymmetric simple exclusion process (ASEP) defined on finite lattice space, where the particles enter/exit from the boundaries with given rates.

Inviscid Burgers equation can be obtained as the corresponding hydrodynamic limit under the hyperbolic space-time scaling.

We examine the formulation of discontinuous boundary conditions from the microscopic dynamics.