

# Derivation of Viscous Burgers Equations from Weakly Asymmetric Exclusion Processes

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We consider in this talk the so-called incompressible limit for the weakly asymmetric exclusion processes. A fundamental question in mathematical physics is the derivation of the master equation of fluids such as the Burgers equation or the Navier-Stokes equation. By the celebrated Varadhan's nongradient method, Esposito, Marra and Yau (1996) and Quastel and Yau (1998) derived the Navier-Stokes equation as the incompressible limits in dimensions strictly larger than 2. On the other hand, the derivation of the Navier-Stokes equation in low dimensions is achieved only from a stochastic lattice gas dynamics with long jumps. In this talk, we discuss the incompressible limit for the weakly asymmetric exclusion processes via recent notable entropy estimates developed by Menezes and Jara. This talk is based on joint work with Milton Jara (IMPA) and Claudio Landim (IMPA).