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Cutoff for the Transience Time for the SSEP with Traps and the One-Dimensional Facilitated Exclusion Process (FEP)

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The facilitated exclusion process is a toy model for phase separation, where particles can jump to an empty neighboring site iff their other neighboring site is occupied. Because of this kinetic constraint, at low densities $\rho \leq 1/2$, the FEP ultimately reaches a frozen state where particles are all surrounded by empty sites, whereas at large densities $\rho > 1/2$, the FEP reaches an ergodic component where it can be mapped to the classical SSEP. In this talk, I will present a new mapping of the FEP to a process that we call SSEP with traps, that displays the same frozen/ergodic phases. I will then focus on the estimation on the transience time needed to reach either an ergodic or frozen state for this model started from the "worst" possible state, which undergoes a cutoff as the size of the system diverges. I will then explore the consequences of this transience time cutoff on the mixing time on the FEP, and on the mixing time of both processes. Based on JW with Brune Massoulié (Université Paris Dauphine).

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