

Nonequilibrium fluctuations for a tagged particle in one-dimensional zero-range processes

We prove the nonnequilibrium fluctuations of a tagged, or distinguished particle, in a class of one dimensional mean-zero zero-range processes with increasing rates.

We present a new approach to establish a “local replacement” for systems with sublinear rates, given that their mixing properties are much different from the ones with linear rates.

The method allows to capture the fluctuations of a “second-class” particle for symmetric zero range processes with unit rate. In addition, for unit rate mean-zero systems, a different “local replacement” limit is given. A corollary of its proof yields the large deviation principle for the empirical measure in these systems.