

CENTRAL LIMIT THEOREM FOR A TAGGED PARTICLE IN A ZERO-RANGE PROCESS OUT OF EQUILIBRIUM

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We prove a central limit theorem for a tagged particle in a zero-range process starting from an initial measure associated to a smooth profile. The scaling limit of the tagged particle in this case is given by a non-homogeneous Itô's diffusion without drift and with diffusion coefficient given in terms of the solution of the hydrodynamic equation associated to the zero-range process. The proof is carried out showing that the environment as seen by the tagged particle has a hydrodynamic limit given by the corresponding stochastic partial equation formally obtained by shifting the hydrodynamic equation for the zero-range process by the limiting Itô's diffusion.