

Abstract: "Einstein relation for random walks in random environment"

The Einstein relation describes the relation between the response of a system to a perturbation and its diffusivity at equilibrium. It states that the derivative of the velocity (with respect to the strength of the perturbation) equals the diffusivity. We consider random walks in an iid random environment (RWRE) under perturbation. We obtain the derivative of the speed of the RWRE assuming one of the following: (i) the environment has no drift and the perturbation satisfies a ballisticity condition; (ii) the environment is ballistic. This is a generalized version of the Einstein relation.