

Regeneration Times Methods for Particle System Growth Models

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Abstract

Regeneration time methods have been an important tool in the study of Random Walks in Random Environment (RWRE). In this talk I will present a construction of a renewal structure of regeneration times which applies to a class of Interacting Particle Systems (IPS): one dimensional growth models. Here I will discuss the details of this construction for the stochastic combustion growth process with threshold A in dimension $d = 1$: particles move like simple random walks and branch whenever they visit sites which have previously never been visited by any particle; furthermore, whenever a particle jumps to a site with A particles, it is annihilated. The situation turns out to be close to the so called marginal-nestling case of transient RWRE. Using these regeneration time methods, we prove that both a law of large numbers and a functional central limit theorem is satisfied by the position of the right-most visited site. Some extensions will be discussed.

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