Fleischmann, Klaus; **Greven, Andreas**

Localization and selection in a mean field branching random walk in a random environment.

(English) Zbl 0771.60095
Ann. Probab. 20, No. 4, 2141-2163 (1992).

Authors' abstract: We consider a continuous time branching random walk on the finite set $\{1, 2, \ldots, N\}$ with totally symmetric diffusion jumps and some site-dependent i.i.d. random birth rates which are unbounded. We study this process as the time t and the space size N tend to infinity simultaneously. In the classical law of large numbers setup for spatial branching models, the growth of the population obeys an exponential limit law due to the localization of the overwhelming portion of particles in the record point of the medium. This phenomenon is analyzed further: The historical path (in space) of a typical particle picked at time t (selection) is of a rather simple and special nature and becomes in the limit singular (in distribution) to the path of the underlying mean field random walk. In general, the properties of the typical path depend on the relation in which t and N tend to infinity.

Reviewer: L.G.Gorostiza (Mexico City)

MSC:

60K35	Interacting random processes; statistical mechanics type models; percolation theory	Cited in **6** Documents
60J80	Branching processes (Galton-Watson, birth-and-death, etc.)	
82B41	Random walks, random surfaces, lattice animals, etc. in equilibrium statistical mechanics	

Keywords:

law of large numbers; spatial branching models; mean field random walk; typical path

Full Text: DOI