

Branching processes in random environment

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Abstract. The talk presents the known results on the asymptotics of the survival probability and limit theorems conditioned on survival of critical and subcritical branching processes in independent and identically distributed random environments.

Keywords: branching processes in random environment, survival probability, limit theorems.

Branching processes in random environment (BPRES) are difficult probabilistic objects the investigation of which requires essential efforts. For the first time the model of a BPRES was considered by Smith and Wilkinson [3] in 1969. Then Athreya and Karlin [1], [2] in 1971 have studied BPRES. Since then a great number of articles have been published investigating the behavior of branching processes in random environment. In short words, a BPRES is a stochastic population model where individuals constituting a generation reproduce independently according to a common offspring distribution. The random environment feature of the model means that the reproduction laws randomly change from one generation to the other. In our talk we summarize some recent findings on critical and subcritical discrete time BPRES under a key assumption that the reproduction laws of particles of different generations are independent and identically distributed. The results we plan to mention are mainly due to the joined efforts of the Russian-German team of researchers consisting of V. Afanasyev, C. Boinghoff, V. Vatutin, E. Dyakonova, J. Geiger, G. Kersting, K. Fleischmann, V. Wachtel. The talk is based on two recent surveys and attracts some earlier results included in an earlier survey [6].

References

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