

北京师范大学 随机数学研究中心

学术报告

报告人：Professor Vladimir Vatutin

题目：Critical Branching Processes in Extremely Non-favorable Random Environment

时间：2023年9月13日，下午4:00—5:00

地点：后主楼 1220

摘要：

Abstract: Let $\mathcal{Z} = \{Z_n, n = 0, 1, 2, \dots\}$ be a critical branching process evolving in a random environment generated by a sequence $\{F_n(s), s \in [0, 1], n = 1, 2, \dots\}$ of i.i.d. probability generating functions. Denote $X_i = \log F'_i(1), i = 1, 2, \dots$ and introduce a random walk

$$S_0 = 0, \quad S_n = X_1 + \dots + X_n, \quad n \geq 1.$$

We impose the following restrictions on the characteristics of the process.

Assumption B1. The random variables $X_n, n = 1, 2, \dots$ are independent and identically distributed in accordance with an α -stable law. Besides, the distribution of X_1 is non-lattice.

Assumption B2. There is an $\varepsilon > 0$ such that

$$\mathbf{E} \left(\log^+ \frac{F''_1(1)}{(F'_1(1))^2} \right)^{\alpha+\varepsilon} < \infty.$$

Given Assumptions B1-B2 we study the asymptotic behavior, as $n \rightarrow \infty$, of the probability

$$\mathbf{P}(Z_n > 0, S_n \leq K),$$

where K is a constant.

This is a work in progress.