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Participant

Family name : Morawiec
First name : Janusz
Institution : University of Silesia
Email : janusz.morawiec@us.edu.pl

Title of the talk

Invariant measures for uncountable random interval homeomorphisms

Coauthor(s)

Tomasz Szarek

Abstract

Fix a probability space (Ω, \mathcal{A}, P) and a function $f: [0, 1] \times \Omega \rightarrow [0, 1]$ such that for every $x \in [0, 1]$, the function $f(x, \cdot)$ is \mathcal{A} -measurable, and for every $\omega \in \Omega$, the function $f(\cdot, \omega)$ is an increasing homeomorphism of $[0, 1]$ onto itself. Assume that for any $x \in (0, 1)$ there exists a set $\Omega_-^x \in \mathcal{A}$ such that $P(\Omega_-^x) > 0$ and $f_\omega(x) < x$ for every $\omega \in \Omega_-^x$, or for any $x \in (0, 1)$ there exists a set $\Omega_+^x \in \mathcal{A}$ such that $P(\Omega_+^x) > 0$ and $x < f_\omega(x)$ for every $\omega \in \Omega_+^x$. We give a necessary and sufficient condition for the iterated function system with probabilities $(\{f(\cdot, \omega) \mid \omega \in \Omega\}, P)$ to have exactly one invariant measure μ_* with $\mu_*((0, 1)) = 1$. We also investigate the properties of this iterated function system with probabilities.