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Stochastic processes in Orlicz function spaces. (English. Ukrainian original) Zbl 0955.60037

Theory Probab. Math. Stat. 60, 73-85 (2000); translation from Teor. Jmovirn. Mat. Stat. 60, 64-76 (1999).

The author considers a random process $X(t)$, $t \in T$, where (T, ρ) is a pseudometric space and μ is a Borel measure on T. Two Orlicz spaces are considered: the Orlicz space $L_V(\Omega)$ of random variables and the Orlicz space $L_U(T)$ of functions on (T, μ). Conditions are obtained under which $\|\|X(\cdot)\|_{L_U(T)}\|_{L_V(\Omega)} < B < \infty$, where $\|\cdot\|$ denotes the Luxemburg norm in the corresponding space. Constants B are estimated. E.g. if $T = [0,1]$, $\mu(dt) = dt$, $V(x) = \exp\{|x|^\alpha\} - 1$, $U(x) = \exp\{|x|^\beta\} - 1$, $\beta > \alpha$, and $\sup_{|t-s|<h} \|X(t) - X(s)\|_{L_V(\Omega)} \le \sigma(h)$ for an increasing function σ with $\sigma(h) \to 0$ as $h \to 0$, $\Gamma = \sup \|X(t)\|_{L_V(\Omega)}$, then for any integer m and $p \in (0,1)$,

$$\|\|X(t)\|_{L_U(T)}\|_{L_V(\Omega)} \le$$
$$\alpha_V \left[\Gamma(\ln(1 + \sigma^{(-1)}(p^m \sigma(1)))^{-1}) + \frac{1+p}{p(1-p)} \int_0^{\gamma p^{m+1}} (\ln(1 + \sigma^{(-1)}(u)^{-1})^{1/\alpha - 1/\beta}) du \right] = B,$$

where α_V is a constant defined in the paper. Spaces L_p are considered too.

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MSC:

60G17 Sample path properties
60G07 General theory of stochastic processes

Cited in **1** Document

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Orlicz space; Luxemburg norm; exponential inequality; random process