

COLLOQUIUM

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Path Properties for Levy Type Processes

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Abstract

Levy-type processes are natural generalizations of Levy processes. They behave "locally" like Levy processes and their infinitesimal generators are operators with variable "coefficients". We are interested in their path properties. Here we present sufficient conditions for the transience and the existence of local times, and the ultracontractivity of the associated Feller semigroup; these conditions are sharp for Levy processes. The proof uses a local symmetrization technique and a uniform upper bound for the characteristic function of a Feller process. As a byproduct, we obtain for stable-like processes (in the sense of R. Bass) on \mathbb{R} with smooth variable index $\alpha(x) \in (0, 2)$ a transience criterion in terms of the exponent $\alpha(x)$; if $d = 1$ and $\inf_{x \in \mathbb{R}} \alpha(x) \in (1, 2)$, then the stable-like process has local times.

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