Loss Rates for Lévy Processes with Two Reflecting Barriers

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Abstract

In this talk we consider a Lévy process $\{X_t\}$ which is reflected at 0 and at $K > 0$. The reflected process $\{V_t^K\}$ is constructed as $V_t^K = V_0^K + X_t + L_t^0 - L_t^K$ where $\{L_t^0\}$ and $\{L_t^K\}$ are the local times at 0 and K, respectively. We consider the loss rate ℓ^K, defined by $\ell^K = \mathbb{E}_{\pi_K} L_1^K$, where $\mathbb{E}_{\pi_K}$ is the expectation under the stationary measure of $\{V_t^K\}$, π_K. Our main result is the identification of ℓ^K in terms of π_K and the characteristic triplet of $\{X_t\}$. We provide a few examples in which ℓ^K is explicitly given by the characteristic triplet of $\{X_t\}$. We also derive asymptotics of ℓ^K as $K \to \infty$ when $\mathbb{E}X_1 < 0$ and the Lévy measure of $\{X_t\}$ is light-tailed.

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