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ON THE EXTREMES OF A CLASS OF NONSTATIONARY PROCESSES WITH HEAVY TAILED INNOVATIONS

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Abstract

We consider a class of nonstationary time series defined by $Y_t = \mu_t + X_t$ and $X_t = \sum_{k=0}^{\infty} C_{t,k}\sigma_{t-k}\eta_{t-k}$ where $\{\eta_t; t \in \mathbb{Z}\}$ is a sequence of independent and identically random variables with regularly varying tail probabilities, σ_t is a scale parameter and $\{C_{t,k},\ t \in \mathbb{Z},\ k > 0\}$ an infinite array of random variables. In this article, we establish convergence of the normalized partial sum of X_t, and we deal with the asymptotic distribution for the normalized maximum. We also investigate, by Monte Carlo simulation, the goodness-of-fit of the limiting distribution.

Keywords: extreme value distributions, poisson random measure, regular varying function, nonstationary process.

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