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Limit theorems for a class of stationary increments Lévy driven moving averages

Joint with Raphaël Lachièze-Rey and Mark Podolskij

In this talk I will present some new limit theorems for power variation of kth order increments of stationary increments Lévy driven moving averages. In the infill asymptotic setting, where the sampling frequency converges to zero while the time span remains fixed, the asymptotic theory gives very surprising results, which (partially) have no counterpart in the theory of discrete moving averages. More specifically, the first order limit theory and the mode of convergence strongly depend on the interplay between the given order of the increments $k \geq 1$, the considered power $p > 0$, the Blumenthal–Getoor index $\beta \in [0, 2)$ of the driving pure jump Lévy process L and the behaviour of the kernel function g at 0 determined by the power α. First order asymptotic theory essentially comprises three cases: stable convergence towards a certain infinitely divisible distribution, an ergodic type limit theorem and convergence in probability towards an integrated random process. A second order limit theorem connected to the ergodic type result is also shown. When the driving Lévy process L is a symmetric β-stable process two different limits are obtained: a central limit theorem and convergence in distribution towards a $(k - \alpha)\beta$-stable totally right skewed random variable.