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Backward Simulation of Correlated Lévy-Negative Binomial Processes for Quantitative Risk modelling

The incorporation of extremal dependence structure is one of the main concerns in quantitative risk modelling especially under abnormal situations such as market failures. The occurrences of these unexpected shocks can be naturally modelled with a multivariate point process. Recent studies on correlated Poisson processes show that backward construction and simulation methods are computationally efficient, and they allow for flexible and extremal correlation structures. In this talk, I will discuss an extension of the backward method to the Lévy-negative binomial process which is an appealing model for over-dispersed count data such as operational losses. The attainable correlation boundaries under the forward and backward approaches will also be discussed.