

On parametric spectral inference for
heavy-tailed time series
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Recently, numerous spectra have emerged to encapsulate the distributional characteristics of non-Gaussian stationary processes. In this talk, we introduce parametric generalized spectra, based on the Fourier transform of the autocovariance of characteristic functions, for heavy-tailed time series, including Cauchy AR and stable INAR models. First, we establish the identifiability of the derived parametric spectra. Second, we propose an estimator for the unknown parameters based on the L_2 -distance between the periodogram and the parametric spectrum. This approach requires no tuning parameters, and we establish its consistency and asymptotic normality. Third, we develop a goodness-of-fit test to determine whether the generalized spectrum of an underlying process belongs to a certain parametric family. Our framework offers a method to distinguish between causal and non-causal Cauchy AR models, test for unit roots in Cauchy MA models, and estimate parameters for infinite-variance integer-valued models. This is joint work with Gaspard Bernard (Academia Sinica).