Quantile spectral analysis
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In this talk we discuss an alternative method for the spectral analysis of a strictly stationary time series. We define a "new" spectrum as the Fourier transform of the differences between copulas of the pairs with lag k and the independence copula. This object is called copula spectral density kernel and allows to separate marginal and serial aspects of a time series. We show that it is intrinsically related to the concept of quantile regression. Like in quantile regression, which provides more information about the conditional distribution than the classical location-scale model, the copula spectral density kernel is more informative than the spectral density obtained from the auto-covariances. In particular the approach provides a complete description of the distributions of all pairs with lag k. Moreover, it inherits the robustness properties of classical quantile regression, because it does not require existence of finite moments. We introduce and compare two different approaches to the estimation of copula spectral density kernels. In particular, we comment on the asymptotic properties of the proposed estimators and discuss several possible extensions.