1 Self-similarity and LRD: some basic connections, and recent developments for the multivariate setting

Long range dependence (LRD) has been gaining great popularity in theoretical and applied Time Series Analysis. It is presently used to model Internet data traffic, volatility of stock prices in Finance, water levels of rivers, and many other phenomena of interest.

A stochastic process is said to be self-similar (s.s.) when its law scales according to a power $0 < H < 1$, the so-called the Hurst parameter. An example of a self-similar process is the classical Brownian Motion.

There are many connections between s.s. processes and LRD time series. In this talk, we will first describe some of them. Then, we will focus on the multivariate setting, for which there are still many open research questions. We will look at multivariate LRD in the light of a class of self-similar processes, called Operator Fractional Brownian Motions (OFBMs). We will establish integral representations of OFBMs and study issues such as time reversibility, spectral properties, identifiability of the parametrization, and symmetry.