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Long range correlations in dynamical systems and in observed data

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Long range temporal correlations (LRC)
in noise-like signals can be detected through
the scaling behaviour of the mean squared displacement (MSD) of the pathes
which one obtains by integrating over the signal. Detrended fluctuation
analysis has become a standard tool which beyond a simple MSD analysis is able
to remove the effects of trends on the signal. In the first part of this talk
we present a sketch of theoretical considerations which give a better
justification for DFA than it has been presented before. In the second part,
we show the consequences of LRC on the convergence of time averages, on the
probability for large deviations, and for the estimation of trends. In order
to transfer these findings to real world data, we need paradigmatic data
models with a minimum of free parameters.

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