



## **MF DFA R package: multifractal analysis for time series**

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The investigation of multifractal properties in time series is an important research topic. Multifractal detrended fluctuation analysis (MF DFA) is one of the most popular approach used in many applications - from environment to finance.

This work presents the MF DFA R package, which contains multifractal detrended fluctuation analysis functions for time series. This R package was used in several papers to analyse wind speed time series.

MF DFA analysis of 119 daily means time series, collected by MeteoSwiss [1] network, enabled to identify correlation, persistence, intermittency and heterogeneity in the wind time series. Furthermore, the dynamical properties of wind speed and the existence of relationship with topographical features was established [2].

Another challenging case study carried out was the MoTus data, which consists of high frequency wind speed (1-min), collected from several anemometers set in an urban area (see [3] for more details). The MF DFA package was used to analyse the linearity/nonlinearity by using the magnitude/sign decomposition method combined with the detrended fluctuation analysis. The study revealed the particular behaviour of wind speed below and above the urban canopy layer [4].

The MF DFA was implemented in an R package, which is well documented and easy to use. In addition, more functions related to the multifractality studies are foreseen to be added in the nearest future. The MF DFA R package is already available on CRAN or/and on GitHub [5].

### References

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