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Multibranch multifractality and the phase transitions in the trading activity

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Empirical time series of inter-event or waiting times are investigated using a modified Multifractal Detrended Fluctuation Analysis operating on fluctuations of mean detrended dynamics. The core of the extended multifractal analysis is the non-monotonic behavior of the generalized Hurst exponent $h(q)$ – the fundamental exponent in the study of multifractals. The consequence of this behavior is the non-monotonic behavior of the coarse Hölder exponent $\alpha(q)$ leading to multi-branchedness of the spectrum of dimensions. The Legendre-Fenchel transform is used instead of the routinely used canonical Legendre (single-branched) contact transform. Thermodynamic consequences of the multi-branched multifractality are revealed. The results [1] are presented for the high-frequency data from Polish stock market (Warsaw Stock Exchange) for intertrade times for KGHM - one of the most liquid stocks there.

[1] J. Klamut, R. Kutner, T. Gubiec, and Z. R. Struzik, 'Multibranch multifractality and the phase transitions in time series of mean interevent times', Phys. Rev. E 101, 063303 (2020)

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