

Statistical Test for Fractional Brownian Motion Based on Detrending Moving Average Algorithm

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Abstract

Motivated by contemporary and rich applications of anomalous diffusion processes we propose a new statistical test for fractional Brownian motion, which is one of the most popular model for anomalous diffusion systems. The test is based on detrending moving average statistic and its probability distribution, which we determined as a generalized chi-squared distribution using theory of Gaussian quadratic forms. The proposed test could be generalized for statistical testing of any centered Gaussian process. Finally we examine the test via Monte Carlo simulations for two exemplary scenarios of subdiffusive and superdiffusive dynamics.

References

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