



A copula spectral test for pairwise time reversibility

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Abstract

In this paper, we propose a new frequency domain test for pairwise time reversibility at any specific couple of quantiles of two-dimensional marginal distribution. The proposed test is applicable to a very broad class of time series, regardless of the existence of moments and Markovian properties. By varying the couple of quantiles, the test can detect any violation of pairwise time reversibility. Our approach is based on an estimator of the L^2 -distance between the imaginary part of copula spectral density kernel and its value under the null hypothesis. We show that the limiting distribution of the proposed test statistic is normal and investigate the finite sample performance by means of a simulation study. We illustrate the use of the proposed test by applying it to stock price data.

Keywords Copula · Discrete Fourier transform · Time reversibility · Periodogram · Spectral density

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