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Test of serial dependence for multivariate time series with arbitrary distributions

Tests of serial independence are presented for a fixed number of consecutive observations from a stationary time series, first in the univariate case, and then in the multivariate case, where even vectors of large dimensions can be used. The common distribution function of the time series is not assumed to be continuous, and the tests statistics are based on the multilinear copula process. A case study using a time series of images is used to illustrate the usefulness of the methodologies presented.