Ianevych, Tetiana O.; **Kozachenko, Yuriy V.**; **Troshki, Viktor B.**

Goodness-of-fit tests for random sequences incorporating several components. (English)

Zbl 1360.62440
Random Oper. Stoch. Equ. 25, No. 1, 1-10 (2017).

Summary: In this paper we have constructed the goodness-of-fit tests incorporating several components, like expectation and covariance function for identification of a non-centered univariate random sequence or auto-covariances and cross-covariances for identification of a centered multivariate random sequence. For the construction of the corresponding estimators and investigation of their properties we utilized the theory of square Gaussian random variables.

MSC:

62M07 Non-Markovian processes: hypothesis testing
60G15 Gaussian processes
60G10 Stationary stochastic processes
62M10 Time series, auto-correlation, regression, etc. in statistics (GARCH)

Keywords:

goodness-of-fit test; random sequence; estimators; asymptotic properties; square Gaussian random variable; expectation; covariance function; time series

Full Text: DOI

References:

[1] Anderson T. W., The Statistical Analysis of Time Series, John Wiley & Sons, New York, 1971. · Zbl 0225.62108

[2] Box G. E. P., Jenkins G. M. and Reinsel G. C., Time Series Analysis: Forecasting and Control, 4th ed., John Wiley & Sons, Hoboken, 2011. · Zbl 0249.62009

[3] Box G. E. P. and Pierce D. A., Distribution of the residual autocorrelations in autoregressive integrated moving average time series models, J. Amer. Statist. Assoc. 65 (1970), 1509-1526. · Zbl 0224.62041

[4] Brockwell P. J. and Davis R. A., Time Series: Theory and Methods, 2nd ed., Springer Ser. Statist., Springer, New York, 2009. · Zbl 1169.62074

[5] Buldygin V. V. and Kozachenko Y. V., Metric Characterization of Random Variables and Random Processes, American Mathematical Society, Providence, 2000. · Zbl 0998.60503

[6] Chen W. W. and Deo R. S., A generalized portmanteau goodness-of-git test for time series models, Econometric Theory 20 (2004), no. 2, 382-416. · Zbl 1072.62088

[7] Hosking J. R. M., The multivariate portmanteau statistic, Statist. Sinica 75 (1980), 602-608. · Zbl 0444.62104

[8] Hosking J. R. M., Lagrange-multiplier tests of multivariate time-series models, J. R. Stat. Soc. Ser. B. Stat. Methodol. 43 (1981), no. 2, 219-230. · Zbl 0474.62086

[9] Ianevych T. O., An ${L_{p}}$-criterion for testing a hypothesis about the covariance function of a rancom sequence, Theory Probab. Math. Statist. 92 (2016), 163-173. · Zbl 1346.60050

[10] Kozachenko Y. V. and Fedoryanych T. V., A criterion for testing hypotheses about the covariance function of a Gaussian stationary process, Theory Probab. Math. Statist. 69 (2004), 85-94. · Zbl 1097.62077

[11] Kozachenko Y. V. and Ianevych T. O., Some goodness of fit tests for random sequences, Lith. Math. J. Stat. 52 (2013), no. 1, 5-13.

[12] Kozachenko Y. V. and Stadnik A. I., Pre-Gaussian processes and convergence in ${C(T)}$ of estimators of covariance function, Theory Probab. Math. Statist. 45 (1991), 51-57. · Zbl 0834.60038

[13] Kozachenko Y. V. and Stus O. V., Square-Gaussian random processes and estimators of covariance functions, Math. Commun. 3 (1998), no. 1, 83-94. · Zbl 0910.60021

[14] Kozachenko Y. V. and Yakovenko T. O., Criterion for testing the hypotethis about the covariance function of the stationary Gaussian random sequence (in Ukrainian), Bull. Uzhgorod Univ. Ser. Math. Inform. 20 (2010), 39-43. · Zbl 1224.62037

[15] Ljung G. M. and Box G. E. P., On a measure on lack of fit in time series models, Biometrika 65 (1978), no. 2, 297-303. · Zbl 0386.62079

[16] Mahdi E. and McLeod A. I., Improved multivariate portmanteau test, J. Time Series Anal. 33 (2012), no. 2, 211-222. · Zbl 1300.62062