



The comparison of performances of several stochastic techniques in the process of forecasting length of day and UT1-UTC time series

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The study aims to compare the performances of uni- and multivariate time series techniques applied to length of day (LOD) and UT1-UTC predictions. In order to predict LOD time series the tidal model of the IERS Conventions was removed first to compute the LODR data and added to the prediction of LODR data, afterwards. To compute UT1-UTC prediction the LOD forecast was integrated to obtain the UT1-TAI prediction and afterwards the leap seconds were added. The considered univariate methods are: LS extrapolation combined with autoregressive (AR) prediction and LS extrapolation combined with autoregressive conditional heteroscedastic (ARCH) prediction. In the case of the multidimensional approach the axial component χ_3 of atmospheric angular momentum (AAM) data - which is considered as an explanatory variable - is taken into account. The AAM data support the LOD/UT1-UTC forecast and lead to more accurate prediction results. In the research, the combination of LS extrapolation and multivariate autoregressive (MAR) approach was also applied to predict LODR data. In these three prediction methods the main signal is being forecasted by LS extrapolation, however, the LODR residuals are being predicted using AR, ARCH and MAR stochastic techniques. The mean and time-dependent UT1-UTC prediction errors corresponding to each of the above-mentioned techniques are presented and compared.