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An Improved Prediction Model of Ozone Concentration Time Series Based on Chaotic Approach

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Abstract : This study is focused on the development of prediction models of the Ozone concentration time series. Prediction model is built based on chaotic approach. Firstly, the chaotic nature of the time series is detected by means of phase space plot and the Cao method. Then, the prediction model is built and the local linear approximation method is used for the forecasting purposes. Traditional prediction of autoregressive linear model is also built. Moreover, an improvement in local linear approximation method is also performed. Prediction models are applied to the hourly ozone time series observed at the benchmark station in Malaysia. Comparison of all models through the calculation of mean absolute error, root mean squared error and correlation coefficient shows that the one with improved prediction method is the best. Thus, chaotic approach is a good approach to be used to develop a prediction model for the Ozone concentration time series.

Keywords : chaotic approach, phase space, Cao method, local linear approximation method
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