QOS2016-24, 2016
Quadrennial Ozone Symposium of the International Ozone Commission

Ozone prediction combined with slow feature analysis

G. Wang

Institute of Atmospheric Physics, Chinese Academy of Sciences, Key Laboratory of middle Atmosphere and Global Environment Observations LAGEO, Beijing, China (wgl@mail.iap.ac.cn)

Almost all climate time series have some degree of nonstationarity due to external driving forces perturbing the observed system. Therefore, these external driving forces should be taken into account when constructing the climate dynamics. This paper presents a new technique of obtaining the driving forces of a time series from the Slow Feature Analysis (SFA) approach, then introducing them into a predictive model to predict non-stationary time series. The basic theory of the technique is to consider the driving forces as state variables and incorporate them into the predictive model. Experiments using ozone data in Arosa, Switzerland, were conducted to test the model. The results showed improved prediction skills.