# Analyses of the time series for the temperature and the humidity

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Recently, researchers in the nonlinear dynamics analyzed and quantified cross-correlations between climatological data. The detrended cross-correlation analysis coefficients showed that, in general, the data were influenced by seasonal components. At present, the models that can apply thedetrended cross-correlation analysis method are more problematic in complex systems, and more detailed research needs to be conducted in order to apply to complex systems in the future. Climate change in the meteorological field has resulted from statistical factors such as rainfall, temperature, humidity, wind velocity, etc. These atmospheric factors have played crucial roles in the abnormal changes within the climates of all continents. Until now, various mathematical models, such as the weather dynamics, forecasts of future climate, and changes in air temperature, among others, have been applied for a variety of purposes.

We use a detrended cross-correlation analysis method to investigate the dynamical behaviors of the time series for the temperature and the humidity. With our model, we calculate the cross-correlation coefficient between changes in the times series for the temperature and the humidity. Our simulation is performed for and restricted to eight cities around the Korean peninsula. The cross-correlation coefficient from the time series of week intervals shows the largest positive value for Sokcho while it shows the largest negative value for Gangrung. Particularly, the results are compared to those between different international cities.