THE EFFECT OF CHANGES ON STATIONARITY IN FUNCTIONAL TIME SERIES

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Economic and financial data often take the form of a collection of curves observed consecutively over time. Such curves can be viewed as a time series of functions. A fundamental issue that must be addressed before an attempt is made to statistically model such data is whether these curves form a stationary functional time series. In this talk I will discuss the interpretation of stationarity in the context of function space valued random variables and introduce testing procedures to test for stationarity in functional data. The tests are developed as nontrivial extensions of the broadly used tests in the KPSS family. The properties of the tests under several alternatives, including changepoint and I(1), are studied, and new insights, present only in the functional setting are uncovered. Particularly, in the case of a change in the mean during the observation period, it is shown that the test statistic will diverge into the direction of the change. The theory is illustrated by a small simulation study and an application to intraday price curves.