Testing equality of distributions of two processes

Denys Pommeret*

*Aix Marseille University, France

Abstract. The comparison of stationary processes is still an important topic with many applications as financial series, environmental data, and so on. The main difficulty comes from testing all the multivariate joint distributions to accept the equality of processes. By simplifying, many papers are concerned by the comparison of the marginal distributions of two processes, but they do not give a satisfactory answer. In this work we propose to test the equality of the distribution of two stationary processes, possibly paired, with short or long memory, by considering all their multivariate joint distributions. Their d dimensional joint densities are expressed in a multivariate orthogonal basis and their k first coefficients are compared. The dimension d and the number k of coefficients can growth with the sample size and are simultaneously and automatically selected by a two step data driven procedure. A simulation study shows the good behavior of the test procedure and real data sets on financial assets of the US economic sectors are examined.