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Change-point problems for multivariate time series using pseudo-observations

In this talk, it is shown that under weak assumptions, the change-point tests designed for independent random vectors can also be used with pseudo-observations for testing change-point in the joint distribution of non-observable random vectors, the associated copula, or the margins, without modifying the limiting distributions. In particular, change-point tests can be applied to the residuals of stochastic volatility models or conditional distribution functions applied to the observations, which are prime examples of pseudo-observations. Since the limiting distribution of test statistics depends on the unknown joint distribution function or its associated unknown copula when the dimension is greater than one, we also show that iid multipliers and traditional bootstrap can be used with pseudo-observations to approximate P-values for the test statistics. Numerical experiments are performed in order to compare the different statistics and bootstrapping methods. Examples of applications to change-point problems are given. This is joint work with Bouchra R. Nasri and Tarik Bahraoui.