MICHIGAN STATE UNIVERSITY
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COLLOQUIUM

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Change-point tests in nonparametric time series models

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Abstract

A weakly dependent time series regression model with multivariate covariates and univariate observations is considered, for which we develop a procedure to detect whether the nonparametric conditional mean function is stable in time against change point alternatives. Our proposal is based on a modified CUSUM type test procedure, which uses a sequential marked empirical process of residuals. We show weak convergence of the considered process to a centered Gaussian process under the null hypothesis of no change in the mean function and a stationarity assumption. This requires some sophisticated arguments for sequential empirical processes of weakly dependent variables. As a consequence we obtain convergence of Kolmogorov-Smirnov and Cramèr-von Mises type test statistics. The proposed procedure acquires a very simple limiting distribution and nice consistency properties, features from which related tests are lacking.