

## ON THE CUSUM OF SQUARES TEST FOR VARIANCE CHANGE IN NONSTATIONARY AND NONPARAMETRIC TIME SERIES MODELS

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**Abstract.** In this paper we consider the problem of testing for a variance change in nonstationary and nonparametric time series models. The models under consideration are the unstable  $AR(q)$  model and the fixed design nonparametric regression model with a strong mixing error process. In order to perform a test, we employ the cusum of squares test introduced by Inclán and Tiao (1994, *J. Amer. Statist. Assoc.*, **89**, 913–923). It is shown that the limiting distribution of the test statistic is the sup of a standard Brownian bridge as seen in iid random samples. Simulation results are provided for illustration.

*Key words and phrases:* Cusum of squares test, variance change, autoregressive model with unit roots, nonparametric regression model, strong mixing process, weak convergence, Brownian bridge.