

# Testing for stability in nonlinear autoregressive models

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CUSUM-type tests based on cumulative sums of estimated residuals, that have been intensively studied for linear regression, can be extended to the situation of nonlinear autoregressive models if the regression function is modeled by a neural network.

We obtain the limit distribution under the null hypothesis of no change in a nonlinear autoregressive model where the regression function is not necessarily given by a neural network. From this we can construct asymptotic size  $\alpha$  tests that are shown to have asymptotic power one for a large class of alternatives. As a by-product consistent change-point estimator related to the test statistics can be obtained in this situation.

Power and size are further investigated in a small simulation study with a particular emphasis on situations where the model is misspecified, i.e. the data is not generated by a neural network but some other regression function. As illustration, an application to the S&P log-returns is given.

This is joint work with J. Tadjuidje-Kamgaing, University of Kaiserslautern.