Residual Empirical Processes for Long and Short Memory Time Series

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ABSTRACT

This paper studies the residual empirical process of long- and short-memory time series regression models and establishes its uniform expansion under a general framework. The results are applied to the stochastic regression models and unstable autoregressive models. For the long-memory noise, it is shown that the limit distribution of the Kolmogorov-Smirnov test statistic studied in Ho and Hsing (1996) does not hold when the stochastic regression model includes an unknown intercept or when the characteristic polynomial of the unstable autoregressive model has a unit root. To this end, two new statistics are proposed to test for the distribution of the long-memory noises of stochastic regression models and unstable autoregressive models.