

Title: Unbiased estimation of near-root autoregressive models

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In many practical cases, the commonly used methods for parameter estimation in the context of time series data such as the maximum likelihood estimator (MLE) and the minimum square error estimator (MSE) exhibit biases. In particular, this problem arises when the parameters are close to the unit root or the process has additive noise. In order to improve these parameter estimation procedures, this talk discusses the development of a simulation-extrapolation (SIMEX) methodology in the context of time series analysis. We consider a standard class of autoregressive processes $AR(p)$ observed at regular times. Further, we study this problem in a class of irregularly autoregressive processes (IAR). Additionally, we analyze the effects of additive noise in the processes. The performance of the proposed SIMEX algorithm is investigated by means of extensive simulations and real-life data illustrations. These results show that the proposed methodology substantially improves the quality of the estimates from MLE and MSE methods, in terms of both bias reduction and estimation precision, in the context of both the regular/irregular and additive noise problems.