

## **Abstract:**

The celebrated Ljung-Box residual analysis is a widely used method in time series for the parameter estimation and the goodness of fit test for the ARMA time series models. The question is whether the fitted for an observed time series, in the Ljung-Box estimation method, possesses the autocorrelation function close or nearly close to the observed series. The answer indeed is not affirmative. In this article, firstly, we present a new procedure in solving the Yule-Walker equations for the exact computation of the autocorrelation functions of ARMA(p,q) models. Secondly, we provided a new parameters estimation method that based on examining the model autocorrelation function against the series autocorrelation coefficients. The effectiveness of the procedure is brought into sight using simulated and real data.