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Dear Editor,

I am submitting a manuscript entitled "NTS: An R Package for Nonlinear Time Series Analysis" by Dr. Rong Chen, Dr. Ruey Tsay, and me for consideration for publication in the *R Journal*.

Time series analysis investigates the dynamic dependence of data observed over time or in space. While linear time series analysis has been extensively studied in the literature with many software packages widely available, nonlinear time series analysis only attracts limited attention. The NTS, a recent R package, offers a number of functions for simulating, analyzing, and predicting nonlinear time series data.

In the paper, we provide an overview of the available functions, and compare NTS with other R packages related to nonlinear time series analysis. The NTS package makes the following contributions:

- It is developed for a wide range of applications, offering comprehensive computational tools using threshold autoregressive models, autoregressive conditional mean models with exogenous variables, convolutional functional autoregressive models, and non-Gaussian state-space models, while existing R packages related to nonlinear time series analysis only solve some specific problems.
- It provides complete solutions with superior performance for the nonlinear models entertained.
- It offers additional options to existing packages with more flexibility.
- It is the first package to provide R access to various sequential Monte Carlo methods for filtering, smoothing, and prediction.

Furthermore, the paper introduces various statistical methods and algorithms for nonlinear time series data, helping users develop a better and deep understanding of this topic. Because of limited check time for R packages released to CRAN, R functions related to Monte Carlo methods in NTS cannot be fully illustrated in the package vignettes or R documentations. Hence, in this paper, we also discuss the functions for sequential Monte

Carlo methods and demonstrate their applications via an example.

Thanks so much for your consideration.

Sincerely,

Xialu Liu, Ph.D.