

Interactive comment on “Detecting long-memory: Monte Carlo simulations and application to daily streamflow processes” by W. Wang et al.

Anonymous Referee #1

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I would like to thank the authors for the detailed response to my comments. I just would like to add a few considerations as I believe that the essence of some of my remarks was not well explained.

1) When one of the purposes of the analysis is to detect the presence of long memory in a time series, the use of several estimators is recommended. It is not a matter of comparing the different techniques. The aim is to increase the reliability of the estimation. The detection of long memory is affected by relevant uncertainty. As many and many estimators are available, why not to use all the available scientific knowledge for better inspecting the behaviours of the analyzed time series?

2) One of nice features of the Whittle’s method is that it provides confidence limits for

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the estimated intensity of long memory. Therefore it is possible to use the estimator as a statistical parametric test. It follows that the use of the Whittle's method would give a substantial additional value to this study, as it would allow to check whether the Hurst exponent is significantly different from 0.5, at an assigned confidence level. The authors state that by using S-MLE the study is more easily reproducible. I believe this motivation is unacceptable from a scientific point of view. The Whittle's method is well known, was used by many authors in the past in view of its nice statistical properties, and computer codes are readily available (see the code in the book by Beran, *Statistics for long memory processes*, Chapman & Hall, 1994).

3) I insist in saying that it was already theoretically and empirically proven that the efficiency of the long memory estimators increases with increasing sample size. This result is obvious. Also, I believe it is nonsense to provide an indication of the minimal sample size required for an efficient long memory estimation. The minimal sample size strictly depends on the behaviours of the time series. The intensity of long memory, the presence of short memory, the variability of the time series are specific behaviours that are highly influential on the reliability of the long memory estimation. It is not possible to provide a general rule. The indication about the reliability of the long memory estimation should be derived case by case. For instance, if one uses a maximum likelihood estimator and derives confidence limits for the estimated intensity of long memory, an indication about the minimal sample size required for obtaining a reliable estimation, at an assigned confidence level, is readily obtained.

These comments refer to a few points only of my original review. Please note that the issues I raised above are as relevant as the other remarks I provided before.

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