

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

### **Anonymous Referee #2**

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#### General Comments

The paper is a routine demonstration of statistical methodology. It is of value in its discussion of previous work on long memory processes, though more introductory material could have been provided for the general reader of HESS (see below). Personally I find Monte Carlo simulations rather unconvincing as demonstrations of matters of principle. An analytical demonstration of the points the authors seek to make would have been more convincing, though I am willing to concede that this may not be tractable.

The significance to hydrologists (if any at all) of the finding that all of the tested time-series exhibit long memory needs to be carefully evaluated. So too does the rather surprising finding that intensity of long-memory is only very weakly related to the scale

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of the basin.

## Specific Comments

The abstract should state the regions for which daily flow series were tested.

Equation 1:  $\Gamma$  is not defined. This equation is quite important and could be illustrated, for example, with some typical plots of  $\rho(k)$  and  $\frac{\Gamma(1-d)}{\Gamma(d)}k^{2d-1}$

Page 1604: The ARFIMA model needs more introduction. Equation 7 should be brought forward to this page and there should be more explanation of the properties of this model.

Page 1605, line 21: H is not defined.

Page 1616, line 5: the statement "as early as possible" is not clear. Does this mean "as early in the 20th Century as possible"? The assertion that this limits the influence of human intervention is hardly well justified if you think of some of the rivers being studied.

Page 1616, line 15: the statement that the series can be "deseasonalized by subtracting the daily means and dividing by the daily standard deviations" is hardly intuitive. Is something missing here?

## Typing and Grammatical Errors

Page 1603, line 5: delete "," after "that" Page 1603, line 7: replace "is" with "are" Page 1606, line 13: delete "of" Page 1612, line 4: insert "it" after "whereas" Page 1614, line 17: replace "test data of enough data size" with "a large enough dataset" Page 1614, line 19: replace "and" with "an"

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