Nonlin. Processes Geophys. Discuss., 2, C542–C544, 2015
www.nonlin-processes-geophys-discuss.net/2/C542/2015/

Nonlinear Processes in Geophysics
Discussions
Open Access

Interactive comment on "Toward a practical approach for ergodicity analysis" *by* H. Wang et al.

Anonymous Referee #2

Received and published: 31 October 2015

General comments: Environmental change has brought great challenges to the hydrological consistency, whether time-series still can be regarded as stationary stochastic process? Is the historical monitoring data consistent with the current monitoring data? Those questions need be studied and answered by the hydrological workers. At present, the non-consistency analysis has become the key and difficult issues in hydrology, but people ignore a very important premise, hydrological sequence has really changed? Is it stochastic changes or certainty change? In this paper, ergodicity analysis is an effective method to answer this question. Therefore, this paper has important theoretical significance and important realistic demand. However, in order to get a general method on this problem, there are three parts need be revised.

Specific comments: 1. L107-111, P6:In the time series analysis, the sample size is large enough to be the most basic requirement. When the sample size is insufficient, it is not appropriate to identify the law by delaying time series length. See postils 1. The

shorter time series, Chinese example, need be removed. American example should be retained and add more American station date as an example. 2. L182-183,P10 and the table 2, the monthly data series of Ankang station are clustered into four classes based on the climatic characteristics. In my opinion, it is in order to increase the number of sample. But in time length of month (30 days) to analyze the precipitation characteristics, there are great differences in the meteorological formation background of each month. In China, for example, the rain is formed in front when monsoon move from south to north .However, the front is different on the formation process and position in each month. Similarly, for a fixed hydrological station, its meteorological background is not the same. Thus, it is recommended to ergodicity analyzed separately for each month (Jan, Feb, Mar ..... Dec). Meanwhile, if the author accepts the above comments, then this item will naturally be modified. See postils 2. 3.L191-195, P11: According to the data in terms of mathematics, there is ergodicity when MT and D (MT) converge to 0. This is a very demanding test conditions, the actual engineering problems is not suitable for using this method to test the cumulative value change after 30 years. In this paper, we only see whether the trend of MT and D (MT) is change in the graph. The trend analysis method is suggested to use to analysis the trend of cumulative value, such as Mann-Kendall test. See postils 3.

Technical corrections: 1. Table 2 appears twice in this paper, maybe is a mistake in writing. 2. In this time, a few of attention was paid to some technical details, such as variables, formulas, and language, etc. and these will be checked carefully in revision manuscript.

Decision: Publish after revised.

Please also note the supplement to this comment:
http://www.nonlin-processes-geophys-discuss.net/2/C542/2015/npgd-2-C542-2015-supplement.pdf