

## ***Interactive comment on “Power-law behavior in millennium climate simulations” by S. V. Henriksson et al.***

**Anonymous Referee #2**

Received and published: 26 June 2012

The paper by Henriksson et al “Power-law behaviour in millennium climate simulations” is a comparative study of scaling properties of modelled and observed global temperature data. I find this research useful, but it lacks references (and somehow repeats substantial results) of the community of statistical physicists who have been studying scaling properties in the climate data since the 90s using detrended fluctuation analysis. Therefore, I request a major revision with comparison of earlier studies.

In particular, a JGR paper by Rybski et al (2008) studies long-term memory in 1000-year simulated temperature record, which is directly related to the present paper, and its results should be cited and compared with the findings of the authors.

Furthermore, it is necessary to add references to related papers by Koscielny-Bunde et al (PRL 1998), Kantelhardt et al (Physica A 2001). Furthermore, the influence of

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forcings on the model scaling performance was studied in Vyushin et al (GRL 2004).

The influence of distribution on scaling performance, which the authors mention as an unresolved problem, was studied in the highly-cited paper by Kantelhardt et al (Physica A, 2002)

Without discussing these materials, the present study is incomplete, in my opinion.

### **MINOR COMMENTS**

In the abstract, it is necessary to give the precise description of the studied data: not just “long time series” but rather “long annual temperature time series”, otherwise the abstract is not informative enough. I understand that one of the series was monthly (Fig.4), but most datasets were annual, and it is necessary to mention. Also, the abstract says about El Nino and Nyquist frequencies but does not provide values, which would be useful to give for the general readership.

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Interactive comment on Earth Syst. Dynam. Discuss., 3, 391, 2012.