

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

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As the review of Anonymous Referee 1 was critical regarding the novelty and significance of our article, we'd like to emphasize what we consider are its most important novel results and strengths. We apologize for perhaps not communicating the main strengths clearly enough in the manuscript and hope that Anonymous Referee 1 may reconsider his/her viewpoint after some clarification.

The following paragraph is a quote from the review: *"General comments The specific methodological details (not shown in the manuscript) are certainly fine, but I do not see how this paper increases any scientific knowledge that is already known (the authors already cite the literature reaching similar results). Hence the significance of the paper is extremely low (although I acknowledge that serious work was done). I cannot*

recommend its publication."

We are grateful for recognition of our method. The method allows us to average over several spectra, giving improved estimates for the spectral form. This is perhaps best illustrated by comparing Figs. 2a and 3b, showing how much closer the averaged spectrum follows a power-law fit in both considered frequency ranges. We are not aware of another study performing similar averaging to improve the spectral estimates. Comparing results for unforced and forced simulations is new research and could provide some important insight to the interplay between external forcing and climate variability at different timescales. We also think that the comparisons between spectra over land and ocean gives insights not brought up by previous studies, both by showing the differences between land and ocean (and between different regions) as well as showing the strong impact of the choice, which frequency range is to be used in a fit.

Instead of being our main conclusions, the good correspondence with previous results in the literature were highlighted to evaluate and validate the Fourier transform method used and to raise confidence in the new results presented. Important comparisons between the new results from simulations and measurements were made. Global mean temperature and the Central England temperature were considered. The successful comparisons are in our opinion important new results.

In this reply, we only considered novelty and significance of the results. We will reply to the other comments of Anonymous Referee 1 a little bit later.

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

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Interactive Discussion

Discussion Paper

