

Interactive comment on “Statistical estimation of global surface temperature response to forcing under the assumption of temporal scaling” by Eirik Myrsvoll-Nilsen et al.

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Received and published: 30 December 2019

We appreciate the comments from the reviewer, and feel they make several valid points. Thus, in the revision we will change the text to accommodate the following:

1. The comparison is performed with a single exponential response function corresponding to a 1-box energy model, against a scale-invariant response function. This will be made more clear in the revised manuscript.
2. Temporal scale invariance in global temperature fluctuations is an empirical observation and not deduced from the fundamental equations describing the system. Nev-

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ertheless, climate models ubiquitously exhibit scale invariance, suggesting that this is a complex-systems phenomenon. It emerges from the interaction between many dynamical components.

Since this discussion is slightly beside the main objective of the current paper, we suggest removing the word "emergent" from the sentence.

3. A reference for the GISS-E2 model will be added.

4. Since the histogram is generated from only 19 different values of TCR (corresponding to the ESMs examined in this paper) its form is highly influenced by the size of the bins. Using bins of width 0.5K (resulting in 3 total bins) would describe a more unimodal distribution with mode in the 1.5-2.0 interval. The posterior distribution obtained from using either a scale-invariant or an exponential response function are still on the lower side of this however. We will comment on this in the revised manuscript.

5. The “dashed” term is used to distinguish between the density and mean of the posterior using an exponential response function from a scale-invariant response function. If this clarification is not needed we can remove it.

Interactive comment on Earth Syst. Dynam. Discuss., <https://doi.org/10.5194/esd-2019-66>, 2019.

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