

Earth Syst. Dynam. Discuss., referee comment RC1
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Comment on esd-2021-62

Anonymous Referee #1

Referee comment on "Climate as a complex, self-regulating system" by Roger N. Jones and James H. Ricketts, Earth Syst. Dynam. Discuss.,
<https://doi.org/10.5194/esd-2021-62-RC1>, 2021

This paper poses the question as to whether the climate is complicated or complex by examining the performance of tropical Pacific variability characterised as "the Pacific Ocean heat engine", and associated teleconnections. A vast array of literature from complexity and dynamical systems approaches to linear response theory, statistical dynamics etc are cited but how that literature relates to the sparse analysis provided eludes me. Many general, qualitative and or speculative, statements e.g. "climate as a self-regulating system governed by the principle of least action" are made without support, with little or no quantitative work provided to back them up.

The authors rely in large part on reviewing existing literature to the extent that the manuscript reads like an unstructured essay. Previously presented simple multistep bivariate tests are relied upon extensively but the new results included are only cursorily discussed e.g. the multiple figures 3 on pages 17 & 20.

In short, I can't find anything rigorous that corresponds to providing an answer to the question posed regarding complexity in the climate system. Moreover, I'm not sure who would not regard the climate system as complex?

In addition:

Figures are incorrectly labelled and only cursorily discussed.

Most of the paper refers to results in an unpublished work "JR21" which has an incorrect reference – or at least one with a doi that is incorrect – but that I am assuming refers to <https://esd.copernicus.org/preprints/esd-2021-61/esd-2021-61.pdf>.

References to a number of papers e.g. those with O'Connor as a co-author are missing.