

# ***Interactive comment on* “Technical Note: Characterising and comparing different palaeoclimates with dynamical systems theory” by Gabriele Messori and Davide Faranda**

## **Anonymous Referee #1**

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Review of “Technical Note: Characterising and comparing different palaeoclimates with dynamical systems theory” by Messori and Faranda

Recommendation: Major Revisions

This manuscript promotes dynamical systems measures for the evaluation and comparison of climate model simulations and climate data sets in general. While dynamical systems methods can surely provide additional insight in climate data, the present study does not make a very convincing case. I do not see the advantage over some other used metrics. So my recommendation is for major revisions before the manuscript can be considered for publication.

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1) Looking at Fig. 1 I do not see how to gain additional insight from the two dynamical systems measures compared with inspecting the precipitation (Fig. 2c).

Only for the control simulation uncertainty bounds are given. My guess is that uncertainty bounds for the other two simulations would overlap with the bounds of the control simulation. If this is the case then one cannot say that the measures actually show any significant differences. They are already now almost always in the uncertainty bounds of the control simulation. So, what do we really learn from this?

2) I do not think that the typical Climate of the Past reader is very familiar with dynamical systems concepts like Poincare recurrences, Axiom A system, etc. The authors should explain them more carefully and in an intuitive way. Has it actually been shown that the climate system is Axiom A?

Perhaps the authors should first provide an intuitive introduction to the concepts and methods and move the more technical details to an appendix.

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