

Interactive comment on “A new ensemble-based consistency test for the Community Earth System Model” by A. H. Baker et al.

Anonymous Referee #2

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General comments: In order to evaluate climate consistency, the authors discussed a new tool, the Community Earth System Model Ensemble Consistency Test (CESM-ECT). The idea is that an ensemble of climate simulations is created to obtain a statistical distribution, which is then used as a benchmark to evaluate whether a new climate simulation is statistically distinguishable from this ensemble. Given that it is difficult for some changes (during model developments) to yield bit-wise identical outputs, this tool becomes very useful and a valuable metric. Moreover, it is simple and could be potentially extended to other global model developments. This manuscript is relevant to model developers and users. I recommend the manuscript be published.

It is desirable for authors to discuss the advantages and/or limitations of Z-score. As pointed out by the other reviewer, Z-score assumes a non-skewed distribution. How-

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ever, for example, the vertical velocity distribution in cumulus regimes is often skewed. Is it valid to use Z-score for such fields?

Minor comments: 1. On P.3831, line 21 "to propagate though the system" should be "to propagate through the system".

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