

Interactive comment on “An efficient method to generate a perturbed parameter ensemble of a fully coupled AOGCM without flux-adjustment” by P. J. Irvine et al.

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We thank the reviewer's for both their positive comments on the methodology and for their helpful criticisms of the manuscript. We have made substantial changes to the text and figures, and some changes to the analysis based on the suggestions of the reviewers. The paper now has much more focused results and discussion sections, and fewer figures. We have changed the basis for our evaluation of the PPE from the CMIP3 ensemble to the ERA-40 1961 – 1990 mean and only use the CMIP3 ensemble to give context to the biases of the PPE. Here we list the major changes made to the sections and figures of the paper and respond to the specific reviewers' comments in

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separate responses.

Abstract – minor changes

Section 1: Introduction – the 'Background on assessment of ensembles' section (1.2 in original) has been cut down considerably and combined with the general background section (1.1 in original). Minor changes to objectives section (1.3 in original)

Section 2: Methodology – minor changes

Section 3: Results – changes to 'pre-industrial spinup' (3.2 in original) including rearrangement of results and some changes in analysis. The other two pre-industrial results sections are combined (3.3 and 3.4 in original) and are significantly changed with a comparison with ERA-40 added and some figures removed. The two 4*CO₂ sections are combined (3.5 and 3.6 in original) and substantially revised to include fewer figures and to be more focused.

Section 4: Discussion – major revisions. The topics in the discussion are now far more distinct from the results sections than in the original version.

Conclusion – some revisions.

Future work – cut.

Figures – All figures have been cut down to four panels or less to enable them to appear at a larger size. Figures 3, 4, 5, 7, 13 and 14 from the original submission have been cut. Panels e and f of figure 1 were combined with the two panels of figure 6 into a single figure. Figures 8 and 9 have been combined and the number of panels reduced. The number of panels in figure 12 has been reduced to four. Some of the panels from figure 15 have been added to two new figures.

Supplementary tables – Supplementary table 3 was cut.

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