

Interactive comment on “Impact of prescribed SSTs on climatologies and long-term trends in CCM simulations” by H. Garny et al.

Anonymous Referee #3

Received and published: 20 April 2009

The paper is investigating the sensitivity of the DLR chemistry-climate model to different sea-surface temperature and sea ice coverage data sets. A model integration "along" the HadISST data set is compared to an integration using the Hadgem1 calculated sea-surface temperatures. The paper documents the biases and changes in trends in the two different integrations. The subject of the paper is suitable for ACP. The paper is largely well written and is an interesting assessment, relevant for many CCMs. A number of small issues (detailed below) require clarification before publication. Subject to minor revisions I would recommend the paper for publication.

P4490L20: This result ? This sentence requires clarification. Is it just stating that the temporal behaviour is different in both runs?

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P4490L22: Be more quantitative about the trend reversal. When is it happening?

P4492L27: Even though ENSO impacts are cited no further discussion relating to the modelled low latitude response is provided later. Maybe the authors would like to reconsider this?

P4496L09: "2" missing in Coriolis parameter.

P4499L18: "delete" respective

P4499L27: Clarification: maximum in column ozone Structure regarding 4.2 and 4.3: 4.2 introduces an idea that has been well explored with methodologies based on the mechanism introduces in 4.3 - I would suggest to swap the order of the subsections and to cite relevant literature (e.g. Fusco and Salby, 1999 and follow up work) to strengthen the argument, notwithstanding the fact that both "mechanisms" are not independent.

P4502L08 What does "mean" mean? HadISST is a monthly mean data set (as is Hadgem).

P4502L20 Some more explanation is required with a stronger link to the figure. I assume the number in each panel is the correlation coefficient? The following discussion might also be the place for mentioning the ENSO link. (Hadgem1 has only a weak ENSO, but the HadISST ENSO should be a stronger constrain/external forcing).

P4507L18 delete the "there's opening" for points 1 and 2.

P4509L01 briefly summarise the Deckert and Dameris result.

P4509L04 EP does not propagate! The refractive index is changing and wave propagation properties are changing and this is reflected in EP flux differences.

P4509L13 Be more specific about the trend reversal. The main finding in this paper seems to be related to the tropics, but the argument is supported with NH high latitude data. Obviously within the BDC framework the two regions are not independent, but try to be clearer (spell out the regions, refer the reader back to figures 6 and 9, etc.).

P4510L11 Make it clear that you refer to TRENDS and DIFFERENCES between different decades in a consistent run, and not absolute values at a given time in the future.

Remove some colloquial language: "reality perfectly", "used to learn", "fortifies", "don't"

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 4489, 2009.

ACPD

9, S1613–S1615, 2009

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