

## ***Interactive comment on “Role of CO<sub>2</sub>, climate and land use in regulating the seasonal amplitude increase of carbon fluxes in terrestrial ecosystems: a multimodel analysis” by Fang Zhao et al.***

**Fang Zhao et al.**

fangzhao@pik-potsdam.de

Received and published: 19 August 2016

There are two main issues raised by the reviewers:

Reviewer 1 asks if results of this study are reproducible. We believe so and the entire TRENDY dataset will be available soon, but the exact website and form of publishing have not been decided. After consulting with my co-authors regarding the data availability, we have added the following in Appendix A: Results of TRENDY models analysed in this study will be made available based on request by the end of 2016 (please contact S. Sitch at S.A.Sitch@exeter.ac.uk for further updates and details).

C1

Reviewer 2 suggests that the evaluation in the earlier part of this paper should be considered in the discussion of the factorial analyses results. Following this suggestion, we found some interesting consistency in the four models that simulate more realistic global seasonal cycle of carbon flux. We have now incorporated these findings in the text, which connects the evaluation with the discussion of the factorial analyses.

Additionally, since the initial submission, Dr. Wiltshire (one of co-authors) from the JULES team has solved the JULES issues, and the new version of JULES simulates a much more realistic seasonal cycle. More accurate description of the original problem has been updated in the manuscript. In the revised manuscript, we have made some changes to methods, results, discussions and conclusions sections, and appendix A, based on reviewers comments. We have also done another round of proofing and made many minor textual changes throughout the text. Specifically, the following items have been changed.

1. Author list. The error in one of the co-author names has been corrected. As a result, the order of co-authors (alphabetic from third author) and institution numbers have changed accordingly.

2. Method. The fact that the simulations analyzed are offline driven by climate and other forcings is stated from the beginning. For the factorial analysis (section 2.4), the linear assumption for the factors is replaced by stating that “climate” and “land use/cover” effects also include some synergy terms, even though we have reasons to believe these terms are likely small in many of the current generation dynamic global vegetation models.

3. Results.

Sect. 3.1. Updated a more accurate explanation (from Dr. Wiltshire) of results from JULES. Replaced the term “Q10” with an explanation that is easier to understand.

Sect. 3.2. Spelled out the four models that showed some decrease in the late 90s.

C2

Sect. 3.3. Stated in the beginning that the models disagree even in sign in their contribution of the different factors. Also added one paragraph discussing the similarity of simulated amplitude increase among the models that simulate a more realistic seasonal carbon flux, relating figure 5 to figure 1.

Sect. 3.3.1. Updated a more accurate explanation (from Dr. Wiltshire) of results from JULES.

Sect. 3.3.2. Discussed the similarity in climate factor for Northern temperate region among the models that simulate a more realistic seasonal carbon flux, relating figure 6 to figure 2.

Sect. 3.3.3. Added a discussion on LPJ results, relating figure 6 to figure 2.

4. Discussions and conclusions. We identify the opportunity for further research, specifically a factorial analysis on long-term sink as a next step to understand which factor contributes to what extent to the correlation in Figure 10.

5. Appendix A. Added the way to obtain the TRENDYv2 data and the related details.

6. Figure 9. Corrected typo in description.

Specific point-by-point responses to each referee have also been posted separately.

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Interactive comment on Biogeosciences Discuss., doi:10.5194/bg-2016-121, 2016.