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Geoscientific
Model Development
Discussions

Interactive comment on "Modeling global atmospheric CO_2 with improved emission inventories and CO_2 production from the oxidation of other carbon species" *by* R. Nassar et al.

Anonymous Referee #1

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This is a very comprehensive paper on the extension of GEOS-CHEM to simulate the formation and transport of the CO2 associated with the oxidation of carbon species such as CO. This paper will be ready for submission after the authors address the following comments and questions.

1. Page 893, lines 7-4: this seems like a repetition of previous statements.
2. Page 894, line 9: are those biospheric fluxes of all carbon species or just CO2
3. Page 895: please redo Figure 1, it is way too small.
4. Page 897, lines 1-5: this seems very much like an ad hoc choice. Could you

substantiate?

5. Page 900, lines 1-9: this section needs clarification as it is unclear if the results discussed here are in agreement or not with other studies.

6. Page 900, line 25: add minus sign for consistency on negative numbers as sink. In addition, it is not clear to me if the ocean sink should be represented as a sink or sink rate? Since the models are changing the CO2 distribution, one would think that a rate would be more appropriate. But maybe the uncertainty is so large that this is not important.

7. Page 907, line 25: Could CH4 be playing a role in this distribution?

8. Page 909, lines 1-8: without the imbalances, would the change in co2 column exactly 0?

9. Section 2.7.3: it is unclear why this is not actually taken into account with the emission correction. Changing the CO distribution only means that the surface emission correction is different?

10. Section 3.1: a scatterplot (Figure 10) might help visualize the results better.

Interactive comment on Geosci. Model Dev. Discuss., 3, 889, 2010.