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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Assessing temporal clear-sky errors in assimilation of satellite CO_2 retrievals using a global transport model" *by* K. D. Corbin et al.

P. Rayner (Referee)

peter.rayner@cea.fr

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This paper explores one of the methodological constraints on the use of satellite CO2 data in inversions. the authors have previously noted the importance and primary cause of sampling biases in the CO2 field due to instrument limitations on limited domains and seasons. Here they extend the study globally and limit their focus to the magnitudes rather than causes of the problem. They confirm that the problem they noted previously is of global scale rather than contingent on the seasons and regions of previous studies. This is a valuable point, even if largely confirmatory of extrapolations from previous results. The confirmatory nature of the results means the paper

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makes a modest but significant contribution in guiding the use of satellite CO2 data. The contribution would have been much larger if not for the success of previous papers involving the same authors. Put bluntly, I would say the importance of appropriate sampling of the model field in either inversion or assimilation applications is now well understood and the machinery of assimilation is well adapted to deal with this. There are many directions in which the authors could have extended this study. For example, while they describe the broad structure of the sampling biases, they make no attempt to interpret them and the complexity of their structure is intriguing. They could also make some comment on the expected impact on inversions although previous work is enough to establish that the impact will be significant. However it is not a task of reviewers to comment on what material is not covered in a paper and the concise and focused study presented is worthwhile in its own right. The paper is well written and I can see only one tiny grammatical correction: P12888L28: "to launch" should be "to be launched" or "for launch" I recommend the paper is published with only this trivial modification.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 12887, 2008.