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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Carbon source/sink information provided by column CO_2 measurements from the Orbiting Carbon Observatory" *by* D. F. Baker et al.

Anonymous Referee #1

Received and published: 15 January 2009

The paper describes a series of simulation inversion studies in preparation for upcoming OCO satellite measurements of CO2. The authors have obviously spent a lot of time making these simulations as realistic as possible, but I am concerned that the length of the paper will affect the readability of the study.

I recommend that the paper be accepted after the authors have made another effort to shorten the paper and address the comments below.

Specific comments

1)The weekly state vector seems strange given the proposed 16-16-day duty cycle of

OCO. The authors have neglected this duty cycle, instead opting to consider either nadir or glint measurements (Table 1).

2)The introduction is too long and needs to be more focused on introducing the study.

3)Page 20054, line 16. Clouds will only decrease the accuracy of the XCO2 retrievals if they are not properly characterised.

4)Page 20054, line 22. GOSAT measures at thermal IR wavelength so it will measure at night.

5)Page 20056, line 10-14. Do the authors mean they average the measurements over the grid box?

6)Page 20056, line 15. Mie scattering?

7)Section 2. Can the authors clarify the local time of OCO? 1.30 is very close to Aqua.

8)Page 20058. Why downgrade the met fields – this will increase model error.

9)Page 20059. Can the authors explain the major differences between the variational approache used in the paper and the one used by LSCE.

10)Page 20062, line 5. How was the imprecise estimate constructed? Looks like a smoothed version of the control estimate.

11)Page 20065. Can the authors clarify the "track-to-box" representation error.

12)Page 20070. I am confused why the authors increase the XCO2 error associated with aerosols, say, and then increase the measurement error variances assumed. Surely they should increase the (unknown) error on the measurements and use an assumed error covariance? Again, page 20076.

13)Page 20073. Assuming only glint measurements is fine for a sensitivity experiment but unrealistic for a control experiment.

14)Page 20075. The authors appear to be bogged down in irrelevant detail.

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15)Page 20084. Transport error can be estimated from tracer transport model spread only if it is calibrated to the truth.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 20051, 2008.

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Interactive Comment