Atmos. Meas. Tech. Discuss., 7, C2415–C2417, 2014
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Atmospheric Measurement Techniques Discussions

Interactive comment on "The Orbiting Carbon Observatory (OCO-2): spectrometer performance evaluation using pre-launch direct sun measurements" *by* C. Frankenberg et al.

Anonymous Referee #2

Received and published: 29 August 2014

Manuscript "The Orbiting Carbon Observatory (OCO-2): spectrometer performance evaluation using pre-launch direct sun measurements" from Frankenberg et al., submitted for publication in Atmos. Meas. Tech., covers an interesting topic appropriate for this journal. The manuscript is very well written, contains a number of relevant well prepared figures and contains interesting new material. I have not identified any major issues related to this manuscript. I recommend publication after the minor issues listed below have been addressed by the authors.

Abstract: line 10: Add "(TVAC)" after "thermal vacuum tests" as this acronym is used at the end of the abstract.

Abstract: line 18: typo “ppm”.

Abstract: last sentence: “A few remaining inconsistencies observed during TVAC may be attributable to the specific instrument setup on the ground and will be re-evaluated with in-orbit data, when the instrument is expected to be in a much more stable environment.” I find it hard to believe that the in-orbit situation is a “much more stable” one than the one on ground. On page 7650 line 17 heliostat alignment changes are mentioned but if I understand correctly, this is not the main reason for this statement (if it is, then I would agree with the statement in the abstract). Instead it is argued by the authors that this is due to instable instrument thermal control and/or illumination conditions as mentioned on page 7653 top. Is it really clear that this will be better in orbit (definitely it will be more difficult to detect)? Please provide more evidence for this in the main text or consider removing “, when the instrument is expected to be in a much more stable environment” in the abstract.

Please explain the meaning of all acronyms when they are used for the first time, e.g., page 7643: line 4 PDT, line 18 JPL, etc.

1 Introduction:

Page 7643, 1st paragraph: Harmonize the writing of “XCO2”. See the different ways how this is currently written in line 6 and line 10, for example.

Page 7643: Line 20: I recommend to replace “direct sun retrievals” by “retrievals using direct sun observations” and to replace “retrieval of reflected sun-light” by “retrieval using reflected sun-light”.

2 OCO-2 instrument overview:

First Figure 2 is referred to and discussed (page 7644, line 23) followed by Figure 1 (page 7645, line 14). Please consider to change the order of these two figures.

Page 7645, line 19: “can’t” -> “cannot”?

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3.4 The Matador test:

Page 7652, line 11: “spectrometer slits”: OCO-2 has only 1 slit, or?

4 Observing the Los Angeles urban dome . . .:

Page 7653, line 26: “onto the NOAA standard in situ CO2 networks” -> “onto the NOAA standard CO2 scale as used for the CO2 networks”?

Figure 1 caption: “0.01 nm” -> “0.1” nm?

Figure 2 caption: “spectra dimension” -> “spectral dimension”.

Figure 10 caption: Harmonize use / not use of capital letters: Orbit, Nadir, glint/Glint.

Interactive comment on Atmos. Meas. Tech. Discuss., 7, 7641, 2014.