

## ***Interactive comment on “The Orbiting Carbon Observatory-2: First 18 months of Science Data Products” by Annmarie Eldering et al.***

**Anonymous Referee #1**

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Manuscript "The Orbiting Carbon Observatory-2: First 18 months of Science Data Products", Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2016-247, 2016, from Eldering et al., presents an overview about the OCO-2 Level 2 data products focusing on the column-averaged CO<sub>2</sub>, i.e., XCO<sub>2</sub>, data product. The manuscript is well written and contains important overview information, which is likely very useful for users of the OCO-2 data products. The topic is appropriate for Atmos. Meas. Tech. and I recommend publication after the comments listed below have been carefully considered by the authors when generating the revised version of the manuscript.

Specific comments:

Abstract: I recommend to add information on which version of the data products is presented (v7/v7r, Lite files) and which time period (September 2014 – January 2016

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?). I find this more important than launch date and the date when OCO-2 joined the A train (it is sufficient to mention the latter in the Introduction).

Page 3, line 21 following: I recommend adding information on where (approx.) the shape is nearly rectangular (high latitudes?) and where it is very narrow (tropics?).

Page 7, line 17-18: Sentence “Enhanced XCO<sub>2</sub> coincident with biomass burning in the Amazon, central Africa, and Indonesian is also obvious in these figures.”. Sorry, but this statement is not supported by the figures shown, which only display XCO<sub>2</sub> but no (independent) information on biomass burning. Please provide more evidence to support that statement or revise the statement.

Page 11, line 13: Statement “and this variability drives the standard deviation”. The standard deviation could also be driven by biases. How can you be sure that this is not the case? Please provide more evidence to support that statement.

Page 11, Section 5.2: The difference of the two curves shown in Fig. 13 is 2-3 ppm which is a large difference for a CO<sub>2</sub> seasonal cycle. Please mention this and comment on this.

Page 11, line 32: Sentence “The OCO-2 record adds additional detail to our understanding of the latitudinal gradients of XCO<sub>2</sub>.”. Really? Please list explicitly what the new knowledge is or revise this statement. Figure 14 shows a large difference between southern hemisphere XCO<sub>2</sub> between the two time periods Sept-April (blue, yellow) and May-Aug (orange, red). Is this assumed to be a real feature?

Page 12, line 33: Please add more info on the 1.5 ppm. Does this number correspond to bias-corrected and quality filtered single observations as contained in the v7/v7r Lite files?

Page 28, Figure 12: Why only Mauna Loa for comparison? Would be interesting to also see comparison with NOAA data for other latitude bands (e.g., to see if the latitudinal dependence in October is consistent with NOAA or not). Please check figure title (I

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guess Jan means “Jan 2016 – Jan 2015” although the title suggests 2015 - 2014).

Typos etc.:

Page 1, lines 10-13: The curly braces “{}” need to be removed, I think.

Page 3, line 5: remove empty space after “4.3.1)”.

Page 5, line 36: Check sentence (“... here, data ...”)

Page 29, Figure 13: Please improve x-axis numbering so that it is easier to see the beginning of each year.

Pages 14 – 18: References: Please check all references carefully: Needs some harmonization, e.g., with respect to authors list: Currently it is (i) a mix of listing only one author, or several or all (sometimes even with “...”), and (ii) author's given name is typically abbreviated but not always, etc. Furthermore mix of “in preparation” and “(in prep)”.

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Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2016-247, 2016.