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Atmospheric Measurement Techniques Discussions
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Interactive comment on "The Orbiting Carbon Observatory-2: First 18 months of Science Data Products" *by* Annmarie Eldering et al.

Anonymous Referee #2

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The manuscript of Eldering et al. provides a nice overview over the data products from the NASA OCO-2 satellite missions and it gives an illustration of some first results. The publications will very informative and beneficial for anybody interested in the OCO-2 data. The article is rather a review article than a strict science publication and is summarizing results from a number of companion papers (many of those are either in review or in preparation). As a consequence, the manuscript is limited in terms of novel science findings but it will be nevertheless a very valuable reference for the science community. One downside is that the manuscript discusses the data release v7 which will be superseded shortly with the release of the v8.

I have some comments/suggestions, mainly related to section 5 that the authors should address. There is also a number of minor corrections that need to be applied.

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What is the reason of showing the growth rate per latitude as figure 12 seems to show very little latitudinal difference. Can you please discuss what you would expect to find and what you do see from OCO-2. What can we learn from the comparison of column data from OCO-2 to Manu Loa in-situ data? Both don't agree very well (eg for Sep the difference is almost 1 ppm) so I don't understand if you try to say that OCO-2 data shows a reasonable growth rate or not. At least, you could select only OCO-2 data around Mauna Loa. Clearly, much more useful would be a comparison to the growth rate from OCO-2 data a TCCON station.

Very similar questions apply to figure 13. This is an 'apples to oranges' comparisons. I think it would be useful to add column data from a model constraint with in-situ data such as CarbonTracker or CAMS so that proper column to column comparisons are possible.

Also, figure 14 does not add much value as no context is given. Adding data from a model to the figure (see above) would allow to gauge if the OCO-2 is roughly consistent with expectations.

Minor comments: p.1 : Correct the assignment of affiliations of authors

p.2, l. 9: For mass balance. . . -> For mass balance reasons. . .

p1. L. 34 measure atmospheric CO2 with -> measure atmospheric CO2 columns with

p.5 l. 35: error of 4% will impart an XCO2 error of 0.22 ppm, 0.12 ppm, and 0.4 ppm -> Connor et al., AMT, 2016 seems to suggest a much larger error in CO2 as a result of 4% radiometric uncertainty. How did you calculate this CO2 error?

p.6 (optical depths less than $\sim$0.35) -> does this refer to the retrieved optical depth which must not agree with the true optical depth?

p.7 SNR design requirements were 290, 270, and 190 at nominal radiance levels -> please give the nominal radiance levels

p.9 eq. 4-1: y, x, F, e are vectors and should be given in bold or use index to show that this is a sum over elements of the vector. Vector should be given in bold in the following paragraph as well. Also, define n.

p. 11 l. 19: selected glint water data only -> selected glint data over water only

p. 11, l.19 175 W to 130W in longitude, and from 15N to 25N -> 175ˆo W to 130ˆo W in longitude, and from 15ˆo N to 25ˆo N

p. 17, l.5: retrieval -> retrieval

p. 17, l. 5-8: There are 2 references labelled O'Dell et al., 2016 Can you confirm that Fig. 6-9 show the same coverage as Fig.. 3-5. It looks different but this might simply due to the different figure size.

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