

Dear Editor,

Here below is the list of the required corrections with my comments, point by point. All the modifications have been applied as requested, the only exception being the captions to figures, which are referring to the 2-column format, where multiple panels appear one on top of the other and not side by side as in the discussion format.

Thanks again, and best regards

G. Bianchini

Detailed list of corrections:

P3,L9: replace “problematics” with “challenges”

corrected

Fig 1 caption: left and right panels, not top and bottom

I think in the final 2-column form this caption will be correct, while in the discussion format the images are put side by side

P5,L11: replace “do” with “does”

P7,L24: replace “it is shown the result of this analysis for two different lines” with “the results for two different lines are shown”

P11,L1: “provided an Ethernet connection”

P12,L3: “expected atmospheric radiance signal”

P12,L4: remove “with respect to the instrument accuracy”

corrected

P12,L17: “continuously performed (or when very dry conditions exist which is frequently at Concordia) during a multi-year”

rephrased, actually “continuously” is not correct (it is not necessary to perform this test continuously), so I specified that this kind of calibration “can be performed whenever needed, during a multi-year deployment of the instrument, provided very dry atmospheric conditions are present (which is frequently the case for Dome C)”

Fig 8: the gray line showing the difference is very hard to see; please increase the context

P13,L6: “of the system; however, this is at the cost of a lower absolute stability of the spectral calibration reference.”

Pg 14,L3: replace “has not to be” with “does not need to be”

P15,L6: replace “performances” with “performance”

P18,L1: replace “evidence” with either “importance” or “note”

corrected

Pg18,L10 (and Fig 13): the downwelling radiance spectrum in the right-hand panel is not from a tropical atmosphere. The tropics have a large PWV and thus there will be significant downwelling radiance in the 800-1000 cm^{-1} spectral region (not \sim zero as shown here). My guess is that the wrong spectrum was accidentally plotted here

Actually the ground-based spectrum is from a tropical-equatorial region, but from an high altitude site (Cerro Toco, 5500 m a.s.l., measurement taken during the RHUBC-II campaign): this has been clarified better in the text

Pg 18,last line: “a software package has”

Pg19,L3: “The software retrieved temperature and water vapor content profiles”

Eq1: no “+” in the equation

Pg 19,L11: “where y and x are the vector” (they were accidentally reversed in the paper)

Pg 19,L12: “VCM” has not been defined in this paper

corrected

Pg20,L10: “Figure 13 left panel”

Fig 15 caption: “in Figure 13 left panel”

same as above: figure positioning will change with 2-column format

Pg20,L21: “data product. The accuracy in the”

corrected

Fig 16: Question: is the low level warm temperatures in the right panel (lowest few m) actually the temperature inside the instrument and/or chimney? If so, this should be noted in the caption or text.

Yes, added few words to clarify both in text and caption

Pg21,L4: “be retrieved. For example, nitrous oxide is obtained...”

Pg21,L6: “In Figurew 17 bottom panel a time series of the retrieved N2O

obtained ...period is shown.”

Pg21,L9: “...is added to the retrieval range. However, the main methane absorption feature overlaps with the absorption bands of the Mylar...” (i.e., remove the “(differently from...main absorption features”

Fig 17 caption: “OMI measurements over the Dome C region are also shown.”

corrected

Pg 22,L9: is there a reference for the OMI data you are using?

I used the public web interface provided by NOAA, I added the URL as a footnote in the text

Pg22,L16: “analysis process provides a valuable tool”

Pg22,L17: “Figure 18 shows the result...”

P22,L19: “without any significant maintenance.”

P23,L20: “relevant cloud-free atmosphere processes, which is the reference case in this work.”

corrected

P24,L13: The extended-range AERI at the ARM NSA site, which has been operating there since 1999, is a similar instrument to the REFIR-PAD in that it measures downwelling spectral radiance in the mid and (part of the) far-IR (although not as deeply into the far-IR). So the statement that “no similar instruments are operating continuously in polar regions” is mis-leading, and should either be removed or reworded.

I made a wrong use of the term “polar”, actually I was meaning “Antarctic”, so I corrected accordingly the text