

We thank the reviewer for his/her constructive comments and suggestions to improve the quality and clarity of our manuscript. We have made careful modifications to the manuscript according to all the comments and suggestions from the reviewer.

Item-by-item responses to the specific comments are provided below, in which the reviews' comments are in **blue**, our responses in **black**, and modifications of the original manuscript are indicated by highlight in **yellow** in the revised manuscript.

Review of Zeng et al. (2023)

Zeng et al. have considerably improved their manuscript according to the comments of the previous round of reviews. All of my comments from the previous review have been considered. In particular I want to acknowledge the efforts made to include the comparison the IASI data in the new section 4.3. From my point of view the manuscript is almost ready for publication, I only wanted to mention two minor points below, which could be addressed just before typesetting.

Specific points:

- Table 1: What does the column "no. of variables" mean? Are these the number of atmospheric layers in case of trace gases? For the interfering trace gases, it is stated in the text that a-priori profiles are scaled, so I would there only expect one "no. of variables". Or do I understand this column wrong?

Yes, it is the number of variables in the state vector. For NH₃ and H₂O, they are 11 atmospheric layers. For the interference gas, it is 1 for each gas. In total there are 5 variables for the five interference gases.

In Table 1, we changed "5" to "**5 (in total)**"

- Section 4.3: I really like the new comparison to IASI now, thanks a lot for this! The only point within this comparison that I am missing is a discussion of the agreement between the data sets including the estimated errors (which has been done in the the previous sections). I think this could be simply done by adding a statement that the data agrees (or not agrees) within the estimated errors of both instruments.

We added "**Except for the daytime data in summer (July and August), both retrievals agree within the estimated error as quantified by rmse in Section 3.5**"