

Review of paper by H. Worden et al.

General comments:

The authors present a study on the validation of TROPES/CrIS carbon monoxide profiles. These TROPES CrIS data retrieved using the MUSES algorithm with single field of view (FOV) radiances provide a better spatial resolution and allows to study plumes in more detail. Therefore, these CO profiles are very valuable when properly validated.

In this paper, this data set is validated against in-situ data from aircraft observations. Averaging kernels are applied to take into account different vertical resolutions. The retrieved CO profiles agree well with the in-situ profiles.

Therefore, I would recommend publishing this paper after minor revisions. The paper is well-written and fits well to the scope of AMT. Please also see specific comments below.

Specific comments:

- p. 7, line 238: Please provide a definition of ‘retrieval quality of 1’.
- p. 10: Is there a reason for limiting the study to 2 years of data?
- p. 13&14: line 396 indicates a potential issue with water vapor: ‘potentially indicating a TROPES CrIS retrieval issue with water vapour or some other interferent’. On the other hand, Fig. 9 and lines 417 to 420 states the seasonal variations are well captured. In case of an H₂O retrieval issue a seasonal variation of the difference between remote sensing and in-situ product is expected, at least outside the tropics. Can you elaborate a bit more on this and the seasonal dependence of the difference between TROPES CrIS and in-situ data?
- p. 18: I missed a comparison with validation results using different retrieval approaches, for example with the multiple FOVs retrieval.

Technical corrections:

- p. 1: TROPES/CrIS in the title, TROPES CrIS later in the text
- p. 3, line 101: TROPES => TROPES
- p. 5, Fig. 2: Some lines are hard to see
- p. 8, Fig. 3: Axis scale is hard to read
- p. 9, line 323: I would suggest to add ‘aircraft data’ or similar:
‘TROPES CrIS CO comparisons with NOAA GML’ =>
‘TROPES CrIS CO comparisons with NOAA GML aircraft data’
- l. 197: Calahorra et al: 2018 => 2021
- l. 767 McMillan => McMillan
- l. 876: a blank line is missing