Atmos. Meas. Tech. Discuss.,
doi:10.5194/amt-2019-419-RC3, 2020

Atmospheric Measurement Techniques Discussions

Interactive comment on "Validation of MOPITT Carbon Monoxide (CO) retrievals over urban regions" *by* W. Tang et al.

Anonymous Referee #3

Received and published: 10 January 2020

Review of

Validation of MOPITT Carbone Monoxide (CO) retrievals over urban regions

By Tang et al.

Manuscript: amt-2019-419

General comments:

The aim of this paper is to evaluate two versions of MOPITT CO (V7 and V8) by comparison with aircraft observations from diverse campaigns all over the globe. Each version has two sub versions (V7-8T, V7-8N, V7-8J for thermal, NIR and TIR+NIR, respectively). Urban and non urban areas are the focus of the evaluation. This is a

paper that complete the list of publications of the evaluation of the different versions of MOPITT CO. Lots of statistics are provided and the MOPITT users community could find some interest in order to interpret MOPITT data over urban areas.

However, I found the comparison sometimes difficult to follow because of the large number of campaigns, the number of aircraft profiles by campaign, number of aircraft profiles over urban regions, the number of MOPITT CO profiles in different circles,.. Table 1 helps but if possible it would be nice to simplify in the text. Moreover, the title does not reflect totally the subject of the paper: the validation of the MOPITT CO retrievals is also over non urban regions. I suggest to change the title in that way.

1) Moreover, the distinction of urban and non urban regions for the comparison of MOPITT CO with aircraft observations could mislead the reader. What is important in this study, is it the carbone monoxide emitted from the urban region or just the urban region with surface parameters different from non urban regions? Such surface parameters that are used in the retrievals of MOPITT CO (surface temperature, emissivity). At 600 hPa, some comparisons are done but this is above the boundary layer. There is a great chance that the CO measured by both MOPITT and the aircraft is transported from other regions that are not representative of urban regions. The author should clarify this point.

2) Also, it would be nice to have a clear recommandation on which MOPITT CO version to use. For example, after reading the table 2 of the paper, I found difficult to conclude on which version to use for urban or a non urban study as well. The statistics are often very similar and I was wondering what is the added value of V8 vs V7 and how significant the values are? It would be nice the authors discuss this point and conclude with clear recommendation in the conclusions on the use of the different versions of MOPITT CO.

3) The Section 4.4 (Sensitivity to the signal-to-noise ratio (SNR) filters) is unclear to me. What are the conclusions we can draw from this section? Is level 3 useless? I

didn't catch the point of this section. Maybe the authors could clarify on how to use Level 3 data over urban and non urban regions in the light of of the use of such SNR filter.

Specific Comments:

Abstract:

In the paper, V7 and V8 of MOPITT CO are evaluated whereas only V8 is mentioned in the abstract.

Section 3.3

L 300-301: This means MOPITT CO concentrations are highly variable in circles where true concentrations are high. In this condition, what are the retrieval errors for these MOPITT pixels?

L 334: please correct the sentence

L 360: please correct the sentence

L 369: The sentence 'we note..' is unclear to me. Please clarify if necessary.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2019-419, 2019.