Atmos. Meas. Tech. Discuss.,
doi:10.5194/amt-2019-241-RC3, 2019

Atmospheric Measurement Techniques Discussions

Interactive comment on "Improving the TROPOMI CO data product: update of the spectroscopic database and destriping of single orbits" *by* Tobias Borsdorff et al.

Anonymous Referee #3

Received and published: 20 August 2019

This paper discusses improvements to the XCO product from TROPOMI, specifically the use of updated spectroscopic databases (evaluated through comparisons with TCCON and the CAMS-IFS model) and two types of destriping methods.

General Comment:

The authors should be careful to exactly define what is meant by certain terms when they are introduced in the text. For instance what is implied by the average bias and standard deviation of the bias? Are all collocated data pairs averaged regardless of their station origin (implying a stronger impact on the average bias for TCCON stations that have many collocations (for instance East Trout Lake) versus stations that have

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few (Edwards)) or is it the average of the individual station biases? From the caption in Fig 3 I assume the latter but this should be mentioned in the main text. Similarly for 'the station-to-station variability of the bias' (again I assume std of the bias over different stations based on the figures)

To evaluate the significance of a bias, the standard error or confidence interval is a far more useful metric than the standard deviation of the bias. Particularly when evaluation different products.

Specific comments:

Concerning the collocation criteria with TCCON: In this study data are collocated within a 50km radius and within the same day. Given that average wind speeds in the free troposphere can quickly reach values of 20 to 30 km/hour, a 2 hour collocation window would be a better match for the chosen spatial collocation radius.

Fig 5: The caption mentions that it is like Fig 3. Yet the rms plot is replaced by a number of coincidences plot. This should be mentioned.

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