

Interactive comment on “Retrieval of xCO₂ from ground-based mid-infrared (NDACC) solar absorption spectra and comparison to TCCON” by M. Buschmann et al.

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We would like to thank Referee 1 for the constructive comments. We will address the general comments one by one. The minor comments regarding grammatical and syntactical errors will be corrected in the final version of the manuscript.

Comment 1: - It would help to show some statistics on how much NDACC and TCCON data was available for this comparison.

Response 1: The following paragraph will be added to Section 2.3: As a basis for the

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analysis, daily means of in total 335 days (TCCON) and 223 days (NDACC) between March 2005 and May 2013 were used. The average number of measurements per day was about 30 for TCCON and 5 for the NDACC 2000 cm⁻¹ region.

Comment 2: - why was the study done with the outdated GGG2012 dataset instead of the current GGG2014?

Response 2: TCCON data based on the GGG2014 retrieval code were not available before the submission of the manuscript for Ny-Ålesund. This delay was caused by significant changes in preprocessing due to a new work flow for the official TCCON product, specifically the reprocessing of the spectra from measured interferograms.

Comment 3: - p. 10526, l. 13: TCCON measurements from Ny-Alesund since 2004? Hard to believe since TCCON only started in 2004. The TCCON archive has data from Ny-Alesund from 2005-03-14.

Response 3: TCCON measurements started in Ny-Ålesund in 2005. However, measurements in the NIR were taken since 2002, but they do not comply with TCCON measurement guidelines and are consequently not available in the archive. The date will be changed in the text.

Comment 4: - you should say more about how this compares to the results by Sussmann et al., 2013, for xCH₄.

Response 4: The introduction will be changed to contain: Sussmann et al. 2013 did a similar study on the inter-comparison of methane from MIR and NIR retrievals. They used a Tikhonov-L1 regularized profile retrieval scheme with the standard NDACC retrieval package SFIT2 for the MIR and the standard TCCON retrieval (GFIT) for the NIR spectra. They conclude that the obtainable information from the retrieval is significantly different between MIR and NIR retrievals, which leads to different seasonal variations.

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