Atmos. Meas. Tech. Discuss., 5, C572–C573, 2012
www.atmos-meas-tech-discuss.net/5/C572/2012/

Atmospheric Measurement Techniques Discussions

Interactive comment on "Long-term validation of total and tropospheric column-averaged CH_4 mole fractions obtained by mid-infrared ground-based FTIR spectrometry" *by* E. Sepúlveda et al.

M. Schneider

matthias.schneider@kit.edu

Received and published: 6 April 2012

Dear Referee,

Many thanks for reviewing our manuscript and for your helpful comments for improving our manuscript.

Concerning your comment on the HF correction method in the mid-infrared please see our reply to Geoff Toon of March 28th. That reply and the there attached revised appendix address in great detail the HF correction procedure and the problems when applying this procedure in the mid-infrared.

Concerning your minor issues:

(1) Thanks for encouraging us to expand the paper by a TCCON study. A TCCON CH4 study is of course of great importance, but in our opinion it should not be done in this paper. We are very concerned that it would redirect the subject of our paper (our paper focuses exclusively on NDACC mid-infrared observation) and that it would lead to further confusion (TCCON CH4 retrievals is a very important topic which needs a detailed study and requires an extra paper). Please see also our argumentation in our reply to the editor.

(2) Yes you are right, we constrain against a-priori profile absolute values and shape, but we do not really understand the second part of your comment. Maybe you overlooked that we do not change our a priori. Please be aware that for the analysis of the whole time series we use one and the same a priori profile. Therefore, all the variability we observe in the retrieved CH4 comes from the measured spectra. So we think that correlations between FTIR CH4, on the one hand, FTIR HF and CH4GAW, on the other hand, are a very good measure for the quality of the FTIR data.

(3) Yes, we see your point, but you have to consider that the kernels we show are for ln[CH4]. Since ln[CH4] kernels show kernels relative to the absolute CH4 amounts, they already take into account that at 5 km there is more absolute CH4 variability than at 21 km (ln[CH4] kernels are a measure of relative variability).

(4) In our opinion the differences on both codes can not explain the different results. Hase et al., 2004 compared the two codes and found residual discrepancies of about 0.1% only.

Many thanks for your technical correction!

Best regards!

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 1381, 2012.