

Interactive comment on “Technical Note: New ground-based FTIR measurements at Ile de LaRéunion: observations, error analysis, and comparisons with independent data” by C. Senten et al.

Anonymous Referee #2

Received and published: 17 January 2008

General comments

This manuscript is not suitable for publication in ACP since the material presented is unfocused and rather of project-report type nature (documenting steps towards operational activity of the Ile de La Reunion FTIR instrument and team), than containing significant new science.

The paper does not provide a significant step forward in the science related to the covered, below listed themes 1) - 5). Earlier scientific achievements are mostly just

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



reproduced and often not referenced. Most of the material does not fit into the ACE validation special issue. The same small ACE validation data set from the Ile de La Reunion FTIR is in parallel submitted via various other papers to this same special issue. This is not laid open to the reader, thus leading to hidden double publication.

We therefore recommend to post this manuscript as an activity report on the BIRA web site, rather than try to force it as an ACP technical note into the peer reviewed literature at this premature stage. Hopefully, in the future a nice consolidated time series from the new FTIR station will become available which can be scientifically exploited as to some dedicated theme and thereby be published with good arguments.

Specific comments

Senten et al. present results obtained by a FTIR instrument placed at Ile de La Reunion. The 2002 campaign data set contains about 10 measurement days, the 2004 campaign about 45 measurement days. Some to-be-solved problems are highlighted. The 2004 data are discussed in terms of a variety of applications,

- 1) error characterization
- 2) comparison with MOPITT
- 3) investigation of transport of biomass burning emissions
- 4) validation against O3 sondes
- 5) satellite validation (ACE, HALOE).

Detailed criticism according to the themes 1) - 5) is listed thereafter.

1) Retrieval and error characterization is performed according to Rodgers' (1990; 2000) concept in Section 3 which gives a lengthy discussion of technical details. Similar applications/implementations of Rodgers' concept have been performed by many groups before. The presented way for quantification of errors from retrieved interfering species is erroneous, and leads to irrelevant numbers: A correct formalism to quantify cross

[Full Screen / Esc](#)[Printer-friendly Version](#)[Interactive Discussion](#)[Discussion Paper](#)

state errors from interfering profile retrievals has been first presented by the TES team (Worden et al., JGR, 2004). This approach was generalized recently, to describe interference errors in infrared remote sounding, including ground-based FTIR applications. These achievements are obviously overlooked and not referenced here.

2) Comparison of FTIR CO to MOPITT shows a bias that is mentioned to agree to earlier findings by Barret et al. (2003) and Emmons et al. (2004). However, there have been further MOPITT validation studies which are not referenced, and the question arises whether Section 4.4 is really intended to be a MOPITT validation study? In this case substantial additional findings would be required relative to the earlier results in order to be publishable in ACP. Or, is the intention in fact only to show that the Ile de La Reunion FTIR is measuring reasonable numbers for CO? The latter would be an internal quality control measure for the Ile de La Reunion FTIR to approach the technical state of the art. This would not be publishable in ACP.

3) A CO enhancement found in the campaign data is attributed to biomass burning source regions using FLEXPART (Section 4). Hundreds of earlier studies have demonstrated this kind of analysis (enter “stohl & long-range” to Google). After more than 10 years the research field of atmospheric (long-range) transport has reached a late and mature phase. Therefore, any new research should discuss what the still open science questions are and how to address which of them. This is not the case in this paper. A strong correlation of enhanced biomass burning CO with enhanced C₂H₆ is derived from the FTIR data in Section 4. This has been found in an analogous way and been discussed in detail earlier, e.g. by Rinsland et al. (1998; 1999, 2000; 2002), or Zhao et al. (2002). We cannot see a science progress beyond these earlier papers in Senten et al. Furthermore, the question arises how this kind of transport study would fit into a special issue targeting upon ACE validation.

4) A validation of FTIR O₃ retrievals versus sondes has been performed earlier by Schneider and Hase (2007), who are not referenced. Schneider and Hase (2007) showed a higher quality and quantity measurement data set and a higher quality re-

[Full Screen / Esc](#)[Printer-friendly Version](#)[Interactive Discussion](#)[Discussion Paper](#)

trieval as to the precision obtained (1 DU). Section 5.2 of Senten et al. shows much fewer coincidences (only 4) and a much less precise retrieval (Table 5), and thus describes a step back in the state of the art.

5) As to ACE validation, the same Ile de La Reunion data are already exploited within several other papers dedicated to validation of individual species within this ACE validation special issue (already appeared in ACPD: Clerbeaux et al. for CO validation, De Maziere et al. for CH₄; submitted: Dupuy et al. for O₃; in preparation: Mahieu et al. for HCl and HF, Strong et al. for N₂O, Wolff et al. for HNO₃, etc.). This critical fact is not at all made open to the reader, and no reference is made to these submitted or to-be-published parallel papers. In this sense, Section 5.3 of Senten et al. represents a double publication. In particular, we like to state that, even presenting strongly modified foci of the validation discussion of Reunion data within Senten et al. relative to the discussion of these data within the other papers dedicated to individual species validation, would not rectify double publication, considering the really small Ile de La Reunion data set data set at hand. Activities related to HALOE validation (Section 5.4) is based upon 6 coincidences, and one of them (Sep 14, 2004) shows unexplained large discrepancies. Senten et al. state, that their results “. . . agree to some extent with previous findings . . .”. This is a very vague comment, but not a science finding worth to be published in ACP. Moreover, it remains unclear, what the current technical or science questions related to HALOE validation are, and how Senten et al. intend to contribute to a progress in HALOE validation with their data set. Furthermore, the question arises why HALOE validation activities are presented in a special issue targeting upon ACE validation.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 827, 2008.

[Full Screen / Esc](#)[Printer-friendly Version](#)[Interactive Discussion](#)[Discussion Paper](#)