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Comment

Interactive comment on “Validation of ACE-FTS v2.2 measurements of HCl, HF, CCl₃F and CCl₂F₂ using space-, balloon- and ground-based instrument observations” by E. Mahieu et al.

Anonymous Referee #1

Received and published: 11 April 2008

This paper compares measurements of ACE-FTS against those of satellite-, balloon- and ground-based instruments. It is generally well-written and thorough. However, I have some suggestions and concerns, particularly about the comparisons with SPIRALE and FIRS-2. While I don't think the comparisons are generally misleading, I don't think they're particularly useful. Their removal would improve the paper by considerably shortening it.

Pg 3452, line 2 reads "...the geophysical situation is suitable for direct comparisons [between ACE and SPIRALE]." I believe this is incorrect because the air measured by SPIRALE, as described in the following paragraph, likely underwent different chemical

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absorption/processing for HCl than the air measured by ACE. Thus, the _meteorological_ situation may have been similar, but the _geophysical_ situation was likely not. If the authors are going to compare HCl from ACE and SPIRALE under these different conditions, the different chemical processings could be accounted for, but they're not. Consequently, the ACE/SPIRALE comparison doesn't add much of value to the paper. I recommend that the ACE/SPIRALE comparison be removed for the sake of brevity, but I don't recommend rejection if it is not. At the very least, however, the line "...the geophysical situation is suitable for direct comparisons..." should be modified to make it clear the authors are referring to meteorology and not chemistry or phase changes.

The ACE/FIRS-2 comparisons are troubling because they were taken in different meteorological contexts for which no corrections are made: ACE at the edge of the northern vortex, and FIRS-2 well inside the vortex. As noted in the paper (pg 3443, line 26), "atmospheric subsidence mismatches are anticipated." Under such conditions, altitude is not an ideal axis to show the comparisons, as they do in Figures 6, 11, 14, and 16. Can these not be done against some tracer of vertical subsidence (perhaps N2O or potential temperature)? Given this, while I don't think it's misleading to present the comparison, it's not very informative. I recommend that the authors either correct for subsidence issues or remove the comparisons.

Page 3436, line 6: "...have completed the picture for..." Such colloquial expressions, while useful, should be avoided where possible as the meaning may be lost for readers not fluent in English and its idioms.

Figures 1 and 2: It's hard to evaluate the AIRS-MLS biases because they've put them on the same scale as the measurements. I suggest over-plotting the differences using a different scale on the right axes.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 3431, 2008.

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