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Interactive comment on “New and improved infrared absorption cross sections for dichlorodifluoromethane (CFC-12)” by J. J. Harrison

Anonymous Referee #1

Received and published: 10 April 2015

Introduction:

They are, in fact, two (not explicitly differentiated), sub-sections, i.e.:

- a) First sub-section on the CFC-12 history and uses facts, which could be shortened;
- b) Second sub-section related with atmospheric concentration measurements, using remote sensing experiments and required retrieval algorithms. The differentiation of these two topics should appear explicitly. Related with b), more details should be given on the direct (forward) and inverse modeling processes and their related requirements; this could be illustrated by the ACE-FTS experiment (related with section 4 concluding

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comments).

Section 4:

As for the introduction, two not differentiated sub-sections appear, i.e.:

a) First sub-section devoted to quality comparisons with Varanasi's former measurements, involving experimental methods and subsequent results. In the assessments lines 8-13, page 2833, try to provide numerical values, to better illustrate the enhanced quality of the presented new work.

b) Second sub-section on the ACE-FTS experiment CFC-12 mixing ratios data retrievals, mentioning spectroscopy quality requirements to lower the residuals. This section should be better associated with b) of the introduction. I would suggest that the related topics on: forward, inverse modeling, and CFC-12 atmospheric content retrievals, should be provided a clearer and more precise emphasis, especially illustrated by the ACE experiment expected performances. The subsequent progresses in CFC-12 atmospheric quantity retrievals, thanks to the new data, could be numerically illustrated ("substantial improvement in the 1σ retrieval errors").

General comment on the paper:

My opinion is that these new results on CFC-12 cross-sections, thanks to improved measurements and producing a much more balanced dataset with wider PT combination coverage, than the previous ones of Varanasi et al., represent a substantial contribution for an improved knowledge of CFC-12 concentration in the atmosphere.

Anyway, it has to be mentioned that continuous recommended experimental improved measurements will be necessary, for their use in future planned hyper-spectral remote sensing experiments. This could be shortly documented and illustrated in the very final conclusions of the paper.

Technical corrections:

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Page 2826 line 6: ODSs (Ozone-Depleting Substances).

Page 2829 line 20: Give the link: <https://www.bruker.com/fr/products/infrared-near-infrared-and-ramanspectroscopy/opus-software/overview.html>, providing OPUS software information; line 24 MCT (Mercury Cadmium Telluride)

Page 2831 line 13: Give intensity unit.

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 2823, 2015.

AMTD

8, C646–C648, 2015

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