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Atmospheric Measurement Techniques Discussions

Interactive comment on "Retrieval and validation of carbon dioxide, methane and water vapor for the Canary Islands IR-laser occultation experiment" *by* V. Proschek et al.

Anonymous Referee #3

Received and published: 2 March 2015

General comments:

The manuscript is rather difficult to follow, with 15 sections. I suggest to move some discussions into an appendix, e.g. parts of the validation data set and potentially others (maybe parts of the uncertainty corrections?).

Major comments:

- with spectroscopic parameters posing such an issue, I would have expected a more thorough investigation into available information. Is e.g. Hitran 2012 providing more accurate values? Are other laboratory or data bases available to obtain more accurate

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information?

- with such a small area sampled, wouldn't it be better to have a local model with a high resolution providing meteorological data, instead of a global one (ECMWF)?

Specific comments:

- Abstract: this is not really a measurement in July 2011, but rather 2 nights, please clarify this

- Page 11602, Line 17: Don't understand why a bias is identified in the weather station data, just because the CRDS has no drift. Did you also confirm the accuracy?

- Page 11607: what kind of moving average filter has been applied?

- Page 11607: when estimating the Delta Tau_sc, has that been applied only on the reference frequency side of the target line? What happens if that is done on the other side, in particular for fairly symmetric lines (e.g. CH4_2, 12CO2-2 in figure 4)? And why is there an offset estimated, not a broadening, which might better fit the observation?

- Figure 4, bottom: some lines show a full mismatch between measured and calculated, e.g. around 4347 cm-1, and these seem to be CH4 as well, which show a better fit for other CH4 lines. Why is that?

- Figure 5: the grey lines are typical measured spectra, and the cyan are some sort of average, but e.g. around 4346 cm-1, all grey lines are below the cyan. Shouldn't the cyan be somewhere in the center?

- Table 5: the Delta Tau_sc value seems to vary still a lot between different files, e.g. 13CO2-1 F12 to F13 shows a large jump, as do the other lines. Any explanation?

Editorial:

- The LMIO in the abstract comes a bit surprising, with no indication what it means.

- Page 11596: suggest to add to e.g. SCIAMACHY that this is no longer working

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- Page 11602: staion - station

- Page 11606: please use cm-1 if you refer to figures with this unit, not um

- Suggest to shorten Brooke 2012 and not use the full reference every time

- Page 11621: particularynarrow typo

- Figure 2, top plot: the legend is rather unclear, it would be better to put just Tx in green letters, Rx in blue letters without a line, and then just in black the cycles and the dots (since there are also blue triangles, green dots in the plot). Although there are so many dots/circles that they are no longer visible.

Interactive comment on Atmos. Meas. Tech. Discuss., 7, 11593, 2014.