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Comment

## ***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.***

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Received and published: 15 December 2014

Here are some comments that I noted down when reading the paper. Figure, page, and line numbers refer to the original submission, so may deviate from the AMTD version.

1. Figures 4 and 5: Near  $4772.0\text{ cm}^{-1}$  there seems to be a quite strong H<sub>2</sub>O line in the simulated data that seems to be completely missing in the measurement. Even in the filtered simulated data in Figure 5 this line is still clearly visible. Can this apparent discrepancy be explained?

2. Page 15, line 502: "This would enable to reduce this uncertainty component in a

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follow-on experiment to smaller than 0.2%." I think this number needs some justification.

Reducing the spectroscopic uncertainty component from now 10% to 0.2% seems to require a reduction in spectroscopic parameter uncertainty (line intensity and line broadening) by a factor of 50. It is not self-evident that such a large improvement is feasible, given the usual systematic errors in laboratory spectroscopy measurements, particularly for the broadening parameter.

3. Page 15, lines 513-515: "Table 6 (fourth column) shows that this fairly limited knowledge on H<sub>2</sub>O that we could get during the campaign strongly governs the uncertainty that we need to conservatively attribute to the H<sub>2</sub>O retrieval results." I do not understand the logic here. I thought Table 6 lists retrieval errors, not validation data uncertainty. Why does the limited validation data accuracy for H<sub>2</sub>O lead to a higher retrieval error?

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

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