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Comment

# ***Interactive comment on “Cross-validation of IASI/MetOp derived tropospheric $\delta D$ with TES and ground-based FTIR observations” by J.-L. Lacour et al.***

**Anonymous Referee #2**

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Studying the isotopes of trace gases have been found to be very suitable in climate and environmental research. It allows better understanding the sources and sinks of the trace gases, or for example drawing conclusions on the history. Of special interest are the atmospheric water isotopes. The variability in delta D is quite large, this allows remote sensing methods to work in that field.

In this paper the fractionation delta D is studied and compared using three different instruments, two satellite instruments, looking down in nadir, and one ground-based remote sensing instrument, looking upwards.

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The paper is written very well, the results are interesting and should be published. I have only a few comments.

Lines 713-718: In this chapter the different sensitivities are discussed. TES and IASI both work in emission, and the ground-based instrument work in absorption. The emission instruments are looking down. For the ground-based instrument the viewing direction is much less important, because its solar absorption. The sensitivities are therefore different, and I would like to see a larger discussion of this topic.

Lines 285-295: Here two retrieval schemes are discussed, the ULB one, and the KIT one. The wording in that chapter sounds a bit as if the KIT algorithm is much better. And then they state that they use the ULB algorithm for the IASI retrieval. This needs to be clarified and rewritten.

Lines 318 – 323: The authors mention in this chapter that the TES V005 data are bias corrected, due to a suspected problem in the HDO spectroscopy. Lateron, when studying literature results for a comparison with aircraft data a remaining bias of 37 permille is mentioned. Here it would be interesting whether the bias correction decreases the remaining bias to 37 permille, or increases it. When studying fractionation processes, potential biases cause a large problem, and need to be discussed sufficiently. Therefore I would like to see here a few more sentences on this topic.

Figure 6: The figure captions on the x-axis are to small.

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Interactive comment on *Atmos. Meas. Tech. Discuss.*, 7, 11087, 2014.

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