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Atmospheric Measurement Techniques Discussions

Interactive comment on "Characterization and Evaluation of AIRS-Based Estimates of the Deuterium Content of Water Vapor" *by* John R. Worden et al.

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Dear authors,

the second review of your paper could not be provided it time. I am submitting this additional review so that the open discussion of your manuscript can be closed.

Best regards

Lars Hoffmann

General comments

As this study is targeting the preparation of a new Earth Science Data Record covering AIRS HDO/H2O observations, it clearly has a high scientific significance. The manuscript itself is clear and concise, but I would agree with Reviewer #1 that the presentation is indeed somewhat "minimalistic" and could be extended and improved. Please carefully follow suggestions and comments provided by Reviewer #1 and those listed below so that the paper can be published soon.

Specific comments

p3, l4: The AIRS swath width is 1650 km (Aumann et al., 2003) rather than 1250 km.

p5, l25-26: Although the AIRS noise is characterized well for individual channels, in other work I noticed noise can be spectrally correlated between neighboring channels, which is due to the 1-D linear detector arrays of AIRS sharing the same electric module (Pagano et al., 2008). This may be too specific to discuss in your paper; I just wondered if you considered this?

Pagano, T. S., Aumann, H. H., Schindler, R., Elliott, D., Broberg, S., Overoye, K., and Weiler, M. H.: Absolute radiometric calibration accuracy of the Atmospheric Infrared Sounder (AIRS), in: Proc. SPIE, vol. 7081, doi:10.1117/12.795445, 2008.

p7, l20-29: Are the HDO retrieval results correlated with the simultaneous H2O retrievals? Does the AVK matrix show any correlations between these retrieval variables?

Fig. 2: Maybe show also the integral of the AVKs, to indicate the amount of measurement information in the retrieval results? (Fix "are _used_ to indicate" in the caption.)

Fig. 4: A legend/definition of the colors used for the plot on the top seems to be missing.

Technical corrections

p1, l17: N. -> Northern (also in other places)

p1, l22: ...reduced spectral resolution _of AIRS_ (for clarity?)

p1, l24: Suggest to remove reference (Worden et al., 2004) from abstract.

p1, l27-28: Please fix incomplete sentence.

p1, l29: Add degree symbols to "30 S and 50 N" (also in other places)?

p2, l2: The copyright statement "All rights reserved." is not allowed in the given form, I think, please see https://www.atmospheric-measurement-techniques.net/about/licence_and_copyright.html for details.

p2, l4: "Introduction:" -> "Introduction"

p3, l11: PAN, -> PAN__

p3, l22: Earth Science Data Records (ESDR's) -> ESDR's (acronym was already introduced)

p4, l25: "a version of the v4 AIRS" -> "version 4 of the AIRS" (?)

p5, l6: will _only briefly_ summarize (?)

p5, l9-10: Not sure if "...appropriate for the corresponding radiance." is a good phrase here?

p6, l4-6: Remove redundant sentence.

p6, l31: Change date format to "1 July 2016" (also in other places).

p7, l2: we _can_ only (?)

p8, l14: indicate_s_

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