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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Retrieval of upper tropospheric water vapor and upper tropospheric humidity from AMSU radiances" *by* A. Houshangpour et al.

Anonymous Referee #1

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General Comment:

This paper is of a technical nature and describes an empirical method for deriving a simple average value of upper tropospheric water vapor representative of the layer between 500 and 200 hPa, rather than a Jacobian weighted quantity. The manuscript is well-written and reads easily. With a few clarifications as to the assumptions made by the method, the paper is suitable for publication.

Specific Comments:

1/ The method proposed for reporting a simple average rather than a Jacobian weighted average should be useful and facilitate direct comparison of AMSU retrievals with other UTLS measurements and model results. Normally, such a comparison would require the measurement sensitivity to be taken into account.

2/ The Introduction should make clear that this is an empirical method that relies on regression rather than a new retrieval based in radiative transfer. As such it is an approximate technique.

3/ The method should have the advantage of speed of computation for comparisons of a large number of retrievals. However, for specific detailed comparisons, a more detailed description that takes into account the particular measurement sensitivity might be more appropriate.

4/ In formulating the regression predictors from physically dependent quantities in sections 3 and 4, the authors should more clearly note where assumptions and approximations are being made, eg. eqns. 1, 3, 5, 9...

5/ Validation by comparing with sondes representing a much wider range of atmospheric humidity conditions would more convincingly support the method. A comparison with measurements from a tropical station in addition to the mid-latitude German station would be useful.

6/ The empirical nature of the method should be noted in the Conclusions.

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 1551, 2005.