

Interactive comment on “Validation of COSMIC water vapor data in the upper troposphere and lower stratosphere using MLS, MERRA and ERA-Interim” by Ming Shangguan et al.

Anonymous Referee #2

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General comments The main subject is a validation of the water vapour content derived from COSMIC measurements. The COSMIC water vapour data quality is examined through comparisons with MLS, MERRA and ERA-Interim products. Water vapour variability in time and in space, on some selected pressure levels, has been investigated as well. The authors assume that the taken here approach, they call it “in a climate perspective”, will allow to better estimate the quality of COSMIC water vapour through examinations in the upper troposphere and lower stratosphere layers.

Specific comments The compared data sets in the validation procedures are monthly and annually averaged secondary measurements. Such data averaging for comparison is broadly used in the research of atmosphere. It is a proper proper way if in the time

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series of measurements there are only known periodical terms (like annual or monthly) and without secular trends. I afraid that it might be not the most optimal way here. In presence of some long periodical terms or some trend (secular changes), and if there are longer gaps in the analysed time series, the accuracy of statistical investigations will be degraded.

Unfortunately results of the comparisons are not clearly described, and the conclusions could be better justified.

Technical corrections Some technical corrections are also required. For example the wording “GPS-Radiosonde observations” is confusing, and must be changed. GPS receiver is used there not as a sounding sensor, like in RO missions, but only to trace 3D position of the sensors. Unfortunately I found more such examples in a number of publications on atmospheric measurements instruments. The sentence must be corrected. Also a portion of the first sentence on the page 4: “the time-frequency contents in the received signals” should be corrected/improved, clear formulated.

Unfortunately I have to share the opinion of the first reviewer that the paper “would be used and cited as justification for using COSMIC water vapour data in the stratosphere”.

I recommend to improve, deeply modify the manuscript (consider all comments of the first reviewer) before publication.

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