

This manuscript reports the results of a large field campaign dedicated to the validation of the water vapor measurements. The number of measurements as well as the comparison results obtained is impressive. The results are synthesized into tables and graphs that give a very good view of the accuracy of each technique our community is able to achieve. The objective about the study of the variability can be seen as an illustration more than an assessment while quantitative results are missing, no specific studies are performed into the mesosphere or the mid-troposphere and real comparisons on the observations of the variability is not performed. This will be very interesting but the comparisons were not primarily focus on the geophysical variability. However, without specific investigations, a summary of the vertical and temporal resolutions according to altitude range can be provided

The point that I think could really be improved in the present manuscript will consist in including a specific section documented the actual state of the art in term of uncertainties on trends, water vapor variability as found in the SPARC reports and also previous existing campaigns or validation efforts.

Also in the conclusion section, authors could include some recommendations for future studies : other campaigns ? what can be improved, ? What next ? statistical studies ? etc.... While a lot of different techniques were deployed during this campaign and because one objective concerns the coverage of the altitude range, some recommendations of an ideal/optimal/realistic setup for water vapor monitoring for NDACC can be proposed based on these comparisons.

Based on the quality of the work presented and considering the additional improvements on the objectives and about the conclusions, I strongly recommend the publication of this manuscript in AMT.

Minor comments :

Line 66 – abstract : this study do not demonstrate the potential for long-term monitoring while no comparison of long series were performed.

Line 210- section lidar : other techniques have been proposed for the calibration, other references can be added.

Line 316 section micro-wave : As one of the issue is the ability to provide measurements at the lowest altitude with this technique, more information on the expected accuracy in the 25-30 km range will be useful.

Line 376 section GPS : Some uncertainties are also associated with this technique. Please , in addition with publications, provide numbers.