

## ***Interactive comment on “Quality assessment of integrated water vapour measurements at St. Petersburg site, Russia: FTIR vs. MW and GPS techniques” by Yana A. Virolainen et al.***

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Author response to reviewer's comments on “Quality assessment of integrated water vapour measurements at St. Petersburg site, Russia: FTIR vs. MW and GPS techniques” by Yana A. Virolainen et al.

Reply to Anonymous Referee #1

First of all, we would like to thank the reviewer for reading and commenting the manuscript.

“The manuscript describes an assessment of 3 remote sensing techniques for measur-

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ing integrated water vapor. These measurements span different but overlapping time periods and are located at the Peterhof NDACC site. They look at specific instrument comparisons and statistical comparisons for the ensemble. They investigate wet/dry biases, effect of distance and time of measurements. They explore two methods for the FTIR retrieval and find a robust correlation that can be used to remove the small bias. The conclusions show excellent agreement among the instruments consistent with similar investigations. Overall this is an excellent paper very nearly ready for publication. This reviewer found only one point that should have some clarification. Pg 4 line 24 the use of the ratio measurement noise to DOFS (also DOFS should be capitalized) with a cutoff of unity as a criterion for acceptable retrievals is not universal or necessarily intuitive and requires some definition or rationalization. This manuscript represents excellent and complete work.”

We used such criterion after analysis of all measured spectra. The idea was to exclude “noisy” spectra that can influence the quality of water vapour measurements from the following analysis. If we take into account only remaining measurement noise, we can lose measurements with large solar zenith angle (SZA), especially during wintertime. Thus, we took a ratio to the number of dofs, which usually increases with increasing SZA. The specific value of this ratio was chosen for both retrieval schemes in accordance with the optimum between two requirements: to exclude “noisy” measurements and to save as much representative measurements in each season as possible. That is why the value of the criterion differs for different spectral schemes. In both cases, we filtered out about 10-13% of all measurements. We added a sentence to the text trying to clarify this item.

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