

Response to Referee 1

The author is grateful to the referee for the careful reading and pointing out the typos and the suggestions for corrections.

All the typos are corrected as suggested by the referee starting from page 1030 until 1048. More information on bad pixels is added in section 5.3.

The answers to the questions are given below:

The averaging kernels appear a little strange. The retrieval height grid is on a higher resolution grid than the measurements. Why are the simulated radiances not convolved with the instrument vertical field-of-view? This is not described adequately in the manuscript.

The retrieval height grid is given by the forward model. A 1 km grid is needed for an accurate simulation of the radiative transfer. The simulated radiances can be convolved with the instrument vertical field-of-view, but recognizing the vertical field of view would need the radiative transfer model (RTM) calculations for a set of altitudes in the field of view. This would require high computational effort. The validation results show that this is not necessary. In this regard, the approach similar to the one used in this study has been successfully applied to SCIAMACHY limb measurements to derive vertical water vapor profiles in the upper troposphere lower stratosphere (UTLS) region (Rozanov, 2011 in the references). We have added a discussion about the FOV along with the suggestion from referee 2 in sect. 6.

p.1051 (l.4)

Specifically, what is "unique" about the SCIAMACHY lunar occultation water vapor dataset since several instruments were used for colocated validation?

The SCIAMACHY lunar occultation coverage is around ~56-89°S. No other used instrument was found to have the span till 89°S. Our validations show that the bias of SCIAMACHY lunar occultation water vapor product is well within the reported biases of the compared measurements from the other instruments. Nevertheless we have replaced the word “unique” by “valuable”.