

Interactive comment on “Cloud liquid water path in the sub-Arctic region of Europe as derived from ground-based and space-borne remote observations” by Vladimir S. Kostsov et al.

Anonymous Referee #2

Received and published: 26 July 2018

The manuscript of Kostsov, Kniffka, and Ionov addresses the increasingly important task to merge spaceborne and ground-based observations for both, evaluation of retrieval techniques as well as for the characterization of the atmospheric state on medium and large scales. They are presenting a comparative study of liquid water path observations performed with microwave radiometer on ground and with SEVIRI aboard the Meteosat satellite. Given the high latitude of the investigated region of St. Petersburg they have to deal with significant parallax effects leading to ambiguities in the SEVIRI retrieval.

Overall, the manuscript is thoroughly structured, but some language editing is defi-

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nately required. I consider the scientific value as average, because the study does not go beyond a documentation of differences/similarities between ground-based and sat-based retrievals of LWP. It is only speculated about reasons for observed differences, and the authors do not point out any ways of omitting or correcting uncertainties in the retrievals. This however, does not prohibit to publish the manuscript because the information given seems to be well document.

Nevertheless, a few major and some minor comments remain which should be addressed before the editor (or a second round of review) will decided upon publication of the manuscript. Please see the comments below:

Section 2.1: This section should contain information about the calibration procedure of the HATPRO. How often where calibrations done? Is there any correlation between time since last calibration and quality of agreement between HATPRO and SEVIRI?

Line 159: Is sampling equal to averaging? If not, what is meant by 'sampling interval'? Does it mean taking just a single 1-s value every X seconds? If yes, why is this done? To safe disk space? To get into better agreement to the temporal resolution of SEVIRI?

Lines 195-200: Suddenly the 'Petergof' site is introduced, but where does it come from? Is this the location of the MW? If yes, it would fit to introduce Petergof in line 195: "...measurement site of Petergof."

Lines 262-263: Is there any possible explanation for the found extremely large discrepancy? Such a statement leaves a very curious reader. ...

Line268ff: Which Seviri pixel was used for the comparison shown in Figure 8? Also at other positions in the text it was not always clear whether the shown results of SEVIRI are an average of the whole domain or only of a single pixel. If there was a general procedure applied, the authors should present it in Section 2.3.

Line 312: Is 'not less' the same as 'at least'? If so, at least would lead to less confusion while reading.

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Line 483: What determines 'systematic' and 'unsystematic' discrepancies?

Lines 487-489, or Line 510: Can the authors present ideas, which parameters should be investigated to identify the reasons for the occasionally observed discrepancies? Would the analysis of rain radar data help? Or can it be attributed to strong small-scale fluctuations of LWP?

Line 165: situation situations

Line 166: form ... from

Line 215: superscript m^{-2}

Line 231: "...not one, but two SEVIRI pixels..."

Line 239: "...20 min and 60 min, respectively."

Line 346: mono-model ... mono-modal

Lines 406-407: "...for the summer months..."

...there are much more typos present in the manuscript...

Figures 2-5: The same scale should be used for all figures. At the moment, each figure shows a different range of values, making a visual comparison impossible. Also, it would be of interest, how many data points are contained in each map. Could the authors provide a map of the number of data points per pixel?

Figure 14: Please show a legend.

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