Review of revised manuscript: **Water vapor estimation based on one-year data of E-band millimeter-wave link in the northeast of China** by Siming Zheng et al.

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Summary evaluation of revised manuscript

I would like to thank the authors for their amount of work put into the revised version of the manuscript. The authors have tried to incorporate all given suggestions, generally up to a satisfactory level. I am also happy to see the comparison with the ECMWF estimates, which gives the statements in this work some extra strength.

I still have some minor suggestions, but after implementation of these suggestions/corrections, the manuscript is ready for publication, in my opinion. See below for my suggestions.

Sincerely,

Ruben Imhoff

General comments

Comparison with ECMWF data

Thanks a lot for incorporating this, I think it really strengthens the manuscript. Last note that I can make about it, is that I think the authors forgot to mention this comparison in the methods (it is mentioned in the abstract, results and so on, but not mentioned as a testing method).

Response to previous comment

"Lines 110–113: The moving average makes sense, I think. Have the authors, however, tested other moving window averages? I.e., where is the optimum and can we even go to higher temporal resolutions?

Response: Thank you for the comment. We tested different time windows and found that 60 minutes is the most appropriate. If the time window is lower than this value, the result after the moving average will not be smooth enough, and higher than this value will make the result after the moving average excessively smooth and distorted, and the hysteresis becomes obvious. Also, the time resolution after moving average is still 1minute."

Can I ask the authors to add their response (the one above) to the manuscript. I think it is valuable information to add to the methods sections where the 60-min window is introduced.

Colorblind-proof figures

Figures 4 and 6 are not colorblind proof. I would recommend the authors to make the figures colorblind proof (red - green is for instance a tricky one). Have a look at e.g. Crameri et al. (2020).

Discussions section

Suggestion: could the authors say something about the operational availability of the required CML data to scale their method up to an operational method in their study region and elsewhere? Thus, how likely is it that we will be using this method operationally in the near future?

Specific comments

Lines 25 – 26 "Compared with ECMWF reanalysis, the link performs better in water vapor density estimation": Quantify this a bit, so how much better (what are the correlation values of the tested estimation techniques)?

Lines 70 – 74: This is a result of the study. Although it is fine to mention why this study adds knowledge to existing literature (e.g. keep the mentioning of the higher temporal resolution and that you compared the results with among others ECMWF estimates), it is better to leave the results for the results section.

Lines 118 – 119 "Since the quantization resolution of the equipment we have used is 1 dB and the quantification resolution of the water vapor density calculated by the weather station is 0.01 g/m^3, the resolution of the two data is inconsistent.": This sentence still requires some extra information, e.g. why is the resolution of both data sets inconsistent?

Lines 225 – 228: Besides the good results that have been reached, also discuss the mean values and the moments when the estimation is not as good. That won't make the story weaker (not at all, actually), but gives an honest overview of the results.

Lines 255 – 260: also add the expected effect this has on the presented results.

Technical corrections

Line 25 – RMSE and relative error values: This is still missing the unit.

Line 40 – "measurement": measurements

Line 90 – "transmit": transmission

Line 105 – "60 dry periods with a duration of 1440 minutes": 60 dry periods with a duration of 1440 minutes per period.

Line 215 – "(Climate Overview of Hebei Province)": Is this a reference? If so, the year is missing.

Line 244 – "Fig. 6 show": shows.

Line 247 – "averaged daily": averaged per day.

Line 256 – "point measurement": point measurements.

Line 275 – "better than ECMWF": which product of ECMWF?

Line 285 – "high density": high spatial or temporal density?

Line 294 – "while the ECMWF is 1 day": while this 1 day for the tested ECMWF product.

Line 306: How do you propose to do that?

Figure 1: on the x-axis of sub figure (a) the degrees N are mentioned. This should be degrees E.

Figure 5 and 6: Something seems to go wrong with the dates on the x-axis, the spacing is no longer uniform. Besides, don't forget to add the units of the RMSE and MRE to the skill scores in figure 6.

References

Crameri, F., Shephard, G. E., and Heron, P. J.: The misuse of colour in science communication, Nat. Commun., 11, 5444, https://doi.org/10.1038/s41467-020-19160-7, 2020.