Atmospheric Measurement Techniques Discussions

Atmos. Meas. Tech. Discuss., referee comment RC2
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Comment on amt-2021-130

Anonymous Referee #2

Referee comment on "Atmospheric precipitable water vapor and its correlation with clear-sky infrared temperature observations" by Vicki Kelsey et al., Atmos. Meas. Tech. Discuss., https://doi.org/10.5194/amt-2021-130-RC2, 2021

General Comments

The work entitled "Atmospheric Precipitable Water and its Correlation with Clear Sky Infrared Temperature Observations" investigates an indirect retrieval approach for Total Precipitable Water based on zenith sky temperature measurements using low-cost infrared thermometers. The approach used by the authors is interesting and scientifically accepted. I appreciate the general flow of the paper; the technique is described in detail and the topic is suitable for the scope of the journal.

I therefore recommend that the manuscript is accepted for publication after the following minor changes.

Specific Comments

A) Please further emphasize the novelty element of this work with respect to the previous

related one, both at the end of the Introduction and in the Conclusions.

B) I am concerned about the TPW dataset, given the large distance between the measuring sites. Could you add any other source, closer to the site of interest?

C) Moreover, while I do not know if this is feasible and meaningful here, I reckon that separating your dataset into training/test subsets would be beneficial for this work, so that you could evaluate the fit on an independent dataset via the standard statistical analysis, hence improving the overall quality of this paper.

D) I wonder whether the –50 degrees instrument threshold has not been too strict a limit in this work and related measurements. Please add few statements explaining why this has (not) been a limiting issue in your work.

E) Finally, I believe this is a paper on the retrieval of Integrated Water Vapor (IWV), since all measurements are in clear sky. If so, I would suggest rephrasing through the whole manuscript.

Technical Corrections

Line 5: "We have analyzed this relationship: what relationship are we talking about? Please amend accordingly.

Line 10/11: “but with parameters that are different than those obtained for the Gulf Coast”. What are you referring to? Please add detail.

Line 36: I suggest replacing “Under clear skies that are the focus of our work” with “In clear sky (the focus of this work),”

Line 51: Please provide an adequate number of references for each method.

I suggest to completely remove the TE1610 sensor discussion from the paper, as I understand it has been no use for this work.

Line 174-175: I find this statement redundant, and overall, I am not expecting to see any type of results from the FLIR instruments, given that you decided not to include any. Again, in line 195, I guess there’s no need to mention it. I suggest keeping only the discussion about instruments/dataset effectively used in the end, as this would make the work neater and improve its flow. However, the discussion in the appendix is just fine, as it “proves” the reason why FLIR3 was not used.