

Atmos. Meas. Tech. Discuss., referee comment RC3  
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## Comment on amt-2021-236

Anonymous Referee #3

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Referee comment on "Global evaluation of the precipitable-water-vapor product from MERSI-II (Medium Resolution Spectral Imager) on board the Fengyun-3D satellite" by Wengang Zhang et al., Atmos. Meas. Tech. Discuss.,  
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The manuscript "Evaluation and Application of Precipitable Water Vapor Product from MERSI-II onboard the Fengyun-3D Satellite" provides an interesting validation of the MERSI-II PWV product worldwide, and then it centers in the application of this satellite to study PWV in Qinghai-Tibet Plateau. In my opinion, the manuscript covers an interesting topic and the research is sound. However, in my opinion section 5 is unnecessary and is not in line with the rest of the manuscript. I do not really see how it fits with the rest of the paper. If authors decide to keep it, it should be properly justified in the introduction. Other general concerns I have about this manuscript are the following:

- I recommend to seek help from a native speaker to revise the English writing.
- Regarding the use of IGRA PWV data, which is integrated up to 500 hPa, Zhang et al. (2018) showed that in tropical regions this can induce important dry bias (they reported a 9% error).
- MERSI-II uses solar radiation (NIR). Therefore, I think the solar zenith angle and the presence of clouds should be considered among the possible influence factors studied.

Therefore I suggest major changes to solve these issues.

### Specific comments

- L50: Before the start of this paragraph I miss a small introduction to the fact that satellite retrieval methods can involve bands in different ranges of wavelengths (IR, NIR, VIS, MW,...).
- From Eq. 5 it is clear that EE 15% is used, but this is not clarified in the text. Also, I would like the authors to clarify the Eq. 5, specifically the 0.05 value added to the  $0.15 \cdot PWV_g$ .

- L179. Why the STD limit is 0.25 cm and not other value?
- L267-268. Thin clouds are claimed to be the reason for MERSI-II underestimation during Summer. Can you provide some prove or reference for this claim? If not, maybe change the sencece to a less definitive one.
- L333-337. I understand the logic of using one month data, but why April? This should be explained in the manuscript.
- L343-344. Maybe this sentence should include a citation.

### **Technical corrections**

- L12: "626 sites" World-wide?
- L12-13: "both present the distribution opposite to latitude". Please rephrase this.
- L15: "peak values". What is this?
- L19: "falling" --> fall
- L20-21: please rephrase
- L25: I would not use "part" here. Maybe "constituent" or "compound".
- L100: " m" should be micrometers.
- L164: "AERONET PWV and AERONET PWV". Maybe it could be something like "AERONET PWV with itself", to avoid repetition.
- L311-312: Please rephrase this sentence (from "Obviously" to "interval")
- Fig. 6 and 7. I think X axis is the same (IGRA PWV), but it is labelled differently (PWV-RAOB, PWV-IGRA)
- Table 2. "Altitude" and "Latitude" got separated in two lines (Altitud-e, Latitud-e).

### **Bibliography**

1. Zhang F, Barriot J-P, Xu G, Yeh T-K. Metrology Assessment of the Accuracy of Precipitable Water Vapor Estimates from GPS Data Acquisition in Tropical Areas: The Tahiti Case. Remote Sensing 10(5):758. <http://www.mdpi.com/2072-4292/10/5/758>