

## **Re-review of "Development of time-varying global gridded Ts-Tm model for precise GPS-PWV retrieval", by Jiang, Ye, Lu, Liu, Chen and Wu**

### **General comments**

In my report on the first version of the manuscript I concluded that it contained interesting material that deserved publication with minor revision of the scientific part and heavy revision of the presentation, due to poor English and other errors.

Unfortunately the situation is still the same.

Scientifically an important improvement has been made by inclusion of the GPT2w model among the global Tm providing models to which the authors new model is compared. This said under the assumption it is the 1 by 1 degree resolution GPT2w version that is used, if it is the 5 by 5 degree, the comparison should be redone.

Language wise the manuscript has been improved a bit, but it is still far from adequate. According to the authors the manuscript has passed a language editing service, but there are still way more errors than what referees and editors can be expected to deal with.

I notice with surprise that the manuscript is still full of occurrences where a space is missing in the text (such as writing "precipitable water vapor(PWV)" instead of "precipitable water vapor (PWV)". It is particularly found in connection with citations. It does not require English language skills to cure that, just a modest effort. When there are six authors, I expect the number of such mistakes to be very close to zero in a second manuscript, when they were notified about the problem in a report on the first manuscript. It is a harsh comment to make, but to me high number of such errors in the second manuscript it is a signal that so far the authors have not taken proper presentation of their material seriously.

I'm sorry to say, but the manuscript must be thoroughly revised to improve the language and other writing errors.

### **Detailed comments (far from exhaustive regarding presentation errors)**

Remove the paragraph in lines 53 to 55, including equation 5. You do a better error budget on page 20.

Lines 68 to 71 contain a statement about Tm models not including current observations not being accurate enough. You must either give references or own examples to substantiate the statement. Otherwise remove it. (It is not a question whether your own model is better, but whether there are examples models like the GPT2w model should not be used in near real-time GNSS meteorology.)

Line 72. Your text says Tm it is related to several surface parameters, according to several studies. It would be good to mention at least one in addition to Ts. If you do not know another surface parameter to which Tm is strongly coupled, rephrase the sentence.

Line 74. Don't use "x" as a sign for multiplication in a formula, just write  $0.72 T_s + 70.2 [K]$

Line 89 Why "4 degrees x 5degrees", not "4 degrees x 5 degrees"? (found several places in the manuscript)

Table 1. Include GPT2w in this table, to provide a comprehensive overview of the resolution of the different models, the information upon which they are based, etc.

Line 157 The full sentence doesn't read well.

Line 175. Maybe the spatial variations are "large" rather than "complicated"?

Line 190. I guess you mean better than previous "models" not "studies"?

Equation 7. Again the "x" is not necessary. Similarly the dots for multiplication inside the sines and cosines are not necessary.

Line 224. You probably mean "In addition,..", not "In contrast,.."

Figure 6. Make a test if using 2 K as minimum value of the color scale for RMSE reveals better the variations in RMSE between the different models (and regions).

Line 269. I think you mean to "find" or "identify" the best Tm model, not to verify it. You verify or validate all the Tm models, afterwards you find or identify the best, at the location of each RS.

line 304. pQ is measured in %, a drop of 0.2 doesn't sound dramatic to me.

Line 407 - 408. What are "comprehensive error sources"? You probably mean that the GPS PWV errors are of the order 1 to 5 mm, with only part of that error being due to errors in Tm, up to 30 % at specific sites.

Notice that one writes 30 %, not 30% (common error in the manuscript).