

Answers to the comments on: “Analysis of the geopotential from NWM at GNSS sites and its influence in IWV computation”

We would like to thank again to the reviewers, especially to reviewer #1, who has contributed significantly to the improvement of this work.

Because both reviewers coincided, we have placed special emphasis on the discussion and conclusions section, including a quantitative assesment of the results and linking them with previous work.

Following, we answer specifically the comments from the reviewers.

Reviewer #1:

1. Title

The title was changed according to the suggestion. We didn't use acronyms in the new title.

2. Section 2.2:

We introduced a new notation to clearly distinguish between the geopotential at the pressure levels (z_i) and at one of the 4-grid points of the NWM around the GNSS station (z_k).

3. P.4, l. 22-27.

Paragraphs at the 1st and 3rd items were eliminated while the paragraph at the 2nd item was reformulated and moved to section 3.1 (Page 8, line 5).

4. P. 6, under/overestimations of IWV by NWM and 10. Fig 2

According to the suggestion, we modified Figures 2 and 4. A new analysis of the under/overestimations is performed in agreement with the new plots (see Page 6).

5. P. 7, l. 5-6

Corrected. We were talking about the GNSS stations.

6. P. 7, L. 8

The paragraph was re-written. (P. 6, l. 30)

7. P. 7, L 18-20

Corrected

8. P. 8, eqs. 7,8 and related text

Equation 8 is redundant and it was eliminated as well as the correspondent paragraph.

9. P. 10, L. 11-18

In agreement with this suggestion, the section 5: Discussion and conclusions was re-written

Technical Corrections:

All the technical corrections were adressed. Here are the details of some particular points:

6. P. 4 L. 14:

This part was removed in the new paragraph.

17. P. 8, L. 27.

This phrase was eliminated.

21. Figure 3.

The correction was made. We also replace the labels into the plot in agreement with the new notation. The caption was modified too for a sake of clarification.

22. Figure 4.

The figure 4 was modified in agreement with the new figure 2 and addressing the comments of the reviewer

Reviewer #3:

General comments:

The Discussion and Conclusions section (Section 5) was re-written including a quantitative appraisal of the results and their comparison with similar findings from previous works.

Specific comments:

P. 1. L. 3.

Yes, microwave radiometers. Corrected.

P2.

Two paragraphs were included in order to take into account the previous strategies of Buehler et al. (2012) and Ning et al. (2013) to deal with the different altitudes when comparing measurements from different data sets.

P. 6. L. 29-35:

Figures 2 and 4 were re-plotted following suggestions from reviewer #1

P. 9. L. 5 and 18:

Corrected

P10. L. 10, 22 and 23-24.

The corrections were addressed. We included comparative percentages and the word "successfully" was eliminated.

Technical corrections:

All corrections suggested by the reviewer were made except those of style (for example: units with super/ sub-indexes in italic fonts).