

Manuscript ID : **gmd-2023-202**
Manuscript title : **Assimilation of GNSS Tropospheric Gradients into the Weather Research and Forecasting Model Version 4.4.1**

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Dear Editor,

Once again, we thank you for organizing our manuscript discussion in the GMD. We really appreciate the Editor's choice of the appropriate reviewers and speeding up the review process. We also thank the reviewers for their valuable comments, which could help us improve the manuscript.

The point-by-point response to the Editor's comments will follow from the next page.

Best regards,

Rohith Thundathil

Dear authors,

Thank you for qualitatively addressing comments raised by reviewers. I support the manuscript for publication after a few minor technical corrections are applied.

We thank the Editor for the prompt and supportive response concerning our manuscript. We are delighted to hear that our past revisions were sufficient for publication in GMD.

Please take a look at GMD guidelines to make necessary technical corrections:

<https://www.geoscientific-model-development.net/submission.html>

such as:

- Please make several changes regarding abbreviations:

(a) Please use a consistent abbreviation for "WRF Data Assimilation" ("WRFDA") throughout the manuscript (currently you employ both "WRFDA" and "WRF DA" - the latter appears for example in Lines 14, 478).

Thanks for pointing it out. We have now corrected it throughout the manuscript.

Please see the Lines: 14, and 487.

(b) Abbreviation "TAMDAR" is used (e.g., Lines 253, 256) before it is defined in Line 268; - please correct this.

Thanks. This has now been corrected.

Please see the Line: 255.

(c) Given the fact that you define "European Centre for Medium-Range Weather Forecasts (ECMWF)", I would also advise you to define a few other abbreviations such as "HARMONIE" (which might be less known than ECMWF).

Thank you for the comment. We have now expanded a few abbreviations in the manuscript.

Please see the Lines:

45: "Action de Recherche Petite Échelle Grande Échelle (ARPEGE)"

49: "High Resolution Limited Area Model (HIRLAM) – Aire Limitée Adaptation Dynamique Développement International (ALADIN) Research on Mesoscale Operational NWP in Euromed (HARMONIE) - Applications of Research to Operations at Mesoscale (HARMONIE-AROME)"

80: "European Reference Frame (EUREF)"

(d) "TEMP" should be defined.

Thank you for the comment. TEMP has now been defined.

Please see the Line 268: "TEMP is a collection of alphanumerical codes established by the WMO. These codes represent upper air soundings obtained through weather balloons launched from either land or sea level. These observations report on the weather conditions in the upper regions of the atmosphere. In WRFDA, FM-35 TEMP is the observation code used to identify radiosonde observations launched from land, and FM-36 for those launched from ships."

(e) Given a large number of abbreviations appearing throughout the manuscript (which can be difficult to read), I would advise you to omit the introduction of abbreviations which you don't use anywhere later in the manuscript such as: "World Meteorological Organization (WMO)", "Global Telecommunication System (GTS)", "Radiosonde (RS) measurements", ... These could be simply "World Meteorological Organization", Global Telecommunication System, "Radiosonde measurements", ...

Thank you for the comment. The abbreviations which are not used anywhere else in the manuscript are omitted.

- Units must be written exponentially (e.g. $W m^{-2}$). Thus please correct the way you write units at several places within the manuscript (e.g., Figures 4, 5, 6, 13, 14).

Thanks. This has now been corrected.

- Labels of figure panels must be included with brackets around letters being lower case (e.g. (a), (b), etc.).

Thanks. This has now been corrected.

- Dates should be written in the following form: 25 July 2007 (dd month yyyy).

Thanks. This has now been corrected.

Please see Lines: 261, 357, 471, and also Fig 14.

- Line 48: "NWP forecasting" -> "NWP" to avoid redundant words.

Thanks. This has now been corrected.

Please see Line: 48.

Thank you in advance for your cooperation.

Best regards,

Nina Črnivec, Topic Editor, Geoscientific Model Development