

Interactive comment on “Validation of new satellite rainfall products over the Upper Blue Nile Basin, Ethiopia” by Getachew Tesfaye Ayehu et al.

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Received and published: 8 February 2018

Authors' response to referees

Dear B. Lapeta (Referee#1),

We would like to thank you for your thoughtful reviews of the manuscript. You have pointed out important issues, and your comments are very helpful to enhance the quality of our manuscript. In the following, a reply to the general and specific comments by the referee#1 is provided. The page numbers both for the comments and in our reply refer to the original manuscript that was reviewed.

General Comments:

C1

1. In general I find the paper well prepared and presenting the results in the concise way. However, the manuscript still needs some technical corrections (please see the file) and completions.

Authors' reply: We are very glad to see that the referee has found our paper well prepared and the results are presented in the concise way. All the technical corrections are considered and corrected accordingly in the revised manuscript and details are provided below in the “Technical corrections” section.

Specific comments:

2. The second refers to the "Data set" section. In the "3.1 Station data" section you wrote about the removal of dataset used for the generation of CHIRPS from the analysis, what is absolutely correct, but nothing is said about the other SREs used in analysis. Both products, TAMSAT and ARC use the ground data. So, it should be clearly stated in this section whether the stations data used in the analysis had to be limited further in order to exclude the data used for TAMSAT and ARC creation or not.

Authors' reply: The Authors agree with the comment. All the station data used for the generation of satellite rainfall estimates (SREs) needs to be removed from the analysis. CHIRPS SREs used rainfall station from national meteorological archives, Global Summary of the Day (GSOD) and Global Telecommunication Systems (GTS). The GSOD and GTS archive also contain stations used to derive the calibration coefficient for TAMSAT and ARC rainfall products. All station data used for the generation of SREs (i.e., CHIRPS, TAMSAT and ARC) were already excluded in our study. Hence, based on the referee comment this has been clearly indicated in the revised manuscript.

Technical corrections:

3. P.10 line 33: “recorded” to “were recorded”

4. P.11line 2 and 5: replace “Table 3” by “Table 2”

5. P.12 line 6: “no any” Usage of both words is not correct. Please delete one of them

C2

6. P.12 line 8: the word “respectively” should be in the brackets along with the numbers
7. P.12 line 12: “Classified” into “classified”
8. P.12 line 20: Change the word “best” by “better”
9. P.12 line 25: Replace “Also” either by “Additionally” or “Moreover”
10. P.12 line 28: the word “respectively” should be in the brackets along with the numbers
11. P.14 line 2: change “except at the months. . .” by “except the months. . .” or “except for the months”
12. P.14 line 8-9: change “. . .where a mainly. . .” by “. . .when a mainly”
13. P. 14 line 10: remove “While”
14. P. 14 line 29: replace “best” by “better”
15. P. 14 line 32: change “High” by “high”
16. P.18 figure 1: replace “ from” by “in”
17. P 19.Table 1: avoid bold
18. P.20 figure 3: replace “of” by “for”
19. P.21 Table 2: change “Only” to “only”
20. P.21 Table 2: add “(. . .), and/as well as probability of detection. . .”
21. P.22 figure 6:change “The root mean square error” by “the Root Mean Square Error” for the whole manuscript to be consistent

Authors’ reply: All the technical corrections (listed from 3 to 21) suggested by the referee has been accepted and addressed accordingly in the revised version of the manuscript.

C3

22. P.1 line 23: correct the word “dekadal” to “decadal- and correct for the whole manuscript.

Authors’ reply: We understood that some articles in the internet have used “decadal” for a 10-days interval and most other for 10-years interval. However, the authors’ believes that the standard way (which has been used by many literatures) of expressing a 10-days interval is dekadal. So, by dekadal we are referring to a 10-days rainfall data.

23. P.11line 29 to 30: Something is missing in this sentence. It looks as there is no predicate in it.

Authors’ reply: Thank you for the comment. The sentence is re-written as follow: "The relatively good performance of CHIRPS at different elevation is partly due to the inclusion of typical physiographic indicators such as elevation in the development of the data sets")

24. P.14 line 2: May? R vale found for this month are quite high (fig 10a) while the ones for April are rather low. Please check it again.

Authors’ reply: Thank you for the comment. You are absolutely right; the r value of CHIRPS for May is quite high. However, the authors’ intention in this regard was to present the performance of CHIRPS in comparison to other SREs. For instance TAM-SAT3 and TAMSAT2 have better r values than CHIRPS in February and May, respectively. CHIRP is better than others for the rest of the months (March, June, July and September) with little and high rainfall. Despite CHIRPS is still better than others during the months of August and April, generally resulted very low r values. This sentence was re-written as follow to avoid confusions.

“... However, over the little rainfall and wet months, the correlation coefficient for CHIRPS was relatively high in comparison to TAMSAT and ARC2 products, except at the months of February and May, with values. . .”

25. P.22 figure 7: It is not clear what does a “wider” mean here. . . Authors’ reply: It is

C4

just to say that comparison of SREs at stations with wider difference in their elevation values. Selected stations at (a) and (b) for example have an elevation difference > 1000m, while (a) and (c) have >2000m. The sentence is re-written as follow better presentation of the figure: "Comparison of SREs at rain gauge stations with wider difference in elevation values (e.g.,>2000 m)"

NB: The revised version of the manuscript is provided as supplement file below.

Please also note the supplement to this comment:

<https://www.atmos-meas-tech-discuss.net/amt-2017-294/amt-2017-294-AC1-supplement.pdf>

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2017-294, 2017.