Hydrology and Earth System Sciences Discussions

Interactive comment on "Assessment of high-resolution satellite rainfall for streamflow simulation in medium watersheds of the East African highlands" *by* M. M. Bitew and M. Gebremichael

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Referee #1H. Leijnse (hidde.leijnse@knmi.nl) This manuscript describes a comparison of the quality of different satellite rainfall products for hydrologic modelling. The paper is very well written, concise, and scientifically sound. I therefore think it can be published with only a few modifications. I have some comments and questions, which are listed below.

Thank you very much for your very useful inputs and kind words.

Specific comments - Are the rain gauge data that are used in this study also included in the TMPA 3B42 product? I assume they are not, given the large differences between the two.

The rain gauges were not part of the GTS rain gauges used in the TMPA 3B42 algorithm.

- There seem to be large differences in SWAT parameter values for the different rainfall products, as well as for the different catchments. These differences could also be used to discuss the large differences among the rainfall products. Could the authors mention something about this in the manuscript?

We have added the following sentence: "There are large differences in the parameter estimates obtained from the different rainfall inputs."

- What are the reasons for the fact that the calibration results for Koga seem to be much better than those for Gilel Abay?

This is especially true for 3B42 and PERSIANN calibration results. The results are also consistent with the validation results. As we discussed in Section 3.3., the 3B42 and PERSIANN estimates for Gilgel Abay get more random errors from the additional pixels.

- Could the CDFs of nonzero rainfall (as in the middle panels of Fig. 4) be added to Fig.3? This would add useful information regarding the distribution of rainfall rates.

Comparison of daily rainfall estimates from point rain gauge measurements and 25-km by 25-km of satellite rainfall pixels (e.g. through CDF) is subject to large scale discrepancy (i.e. large random errors in spatial representativeness of the point measurements). Therefore, we only showed the bias at the monthly scale (assumption: average of point rainfall across all rain rates and the entire year can safely represent the 25 km by 25 km average annual rainfall).

- On p. 8220, line 4, it is stated that "the accuracy of the simulations" is discussed in Section 3. However, in the remainder of Section 3, the simulation results (and not the simulation accuracy) are discussed.

We have modified the sentence to read "In this section, we discuss the simulation results."

- On p. 8221, line 10, "3B42" should be "3B42RT". - On p. 8221, line 11, "3B42RT" should be "3B42". - On p. 8221, line 16, "3B42" should be "3B42RT". - On p. 8221, line 17, "3B42RT" should be "3B42".

Thank you. We have corrected the typing errors.

- On p. 8226, Table 1, please add the names of the different rainfall products to the table header for the last five columns.

Done; thank you.

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