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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Can we trust remote sensing ET products over Africa?" *by* Imeshi Weerasinghe et al.

Anonymous Referee #1

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Summary The manuscript has followed a commendable approach to evaluate eight diverse ET products and presented a ranking of the different products on data sparse region. The method evaluated 8 products using a basin water balance ET and Budyko curve over several basins across Africa using the average of three precipitation products along with observed runoff data. Care was taken to ensure the assumption of negligible storage change over several years by removing basins that showed trends using the MK test.

The manuscript is well-written with a useful application and contribution to the remote sensing community. I have a few general and specific comments that could improve the manuscript.

General: Considering Figure 6, 7 and 8 are key results for the ranking shown in Table

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3, the method needs to flesh out how the data points are generated. For example, in Figure 6 seems to show correlation (r) across basins using the mean value for RS and WB ET. As indicated the correlation values are strong for all, but a root mean square error (RMSE) may have been a more useful metrics to compare the different models as that includes bias information. Also, it is not clear if the r difference between adjacent models is significantly different to rank them in a different order. I would think assigning a different rank order when the "r" are not significantly different may inflate the order. But the use of RMSE in the ranking may be more robust and it is not clear why this are not used. Similarly, Figures 7 and 8 could benefit from statement that the table values represent one data point for each basin and the average is the average of all basins, if that is correct? But unless the values in Figures 7 and 8 are missing negative biases, it is not clear how the average becomes so small when the percentage difference in each basin is much higher, as much as 73%. The difference between Figures 7 and 8, i.e., average and weighted average is not clear. Are the weights (basin area) assigned only to the RS ET or to both RS and WB ET and in that case does this mean volumetric ET difference? Again, a more detailed description is required in the methods section.

Landcover: it is not clear why the study did not include more land cover types, especially knowing the chosen two landcovers (water and irrigated lands) may not be handled well by some of the models

Specific comments; 1) Tables and figures would need improved captions and header names that would help them stand alone. 2) Figures 7 and 8 may benefit from one more panel which shows the average of the three precipitation products as the ranking is based on the average the three. 3) Zoom-in maps: it is hard to see the differences in Figures 9 and 10 among models. Maybe it is better to show deviations from the MPM data, i.e., show MPI in mm but the rest of the models as differences from MPM. Also remove the grid linesâĂŤhard to read the maps. A better color ramp will help readability. 4) Revisit carefully the description and citation of some products. For example, SSEB vs SSEBop. As far as I know the global product is from SSEBop with a different citation

with a 10-day (dekad) time scale, not monthly. Model's pre-defined boundary limits are described in SSEBop's work and not in the indicated citations. 5) It will be useful to include data source (website link) of the different models for access and discuss why the different models appear to discontinued. 6) Include some discussion on the performance of MTP in relation to the WB ET (rank 5) and the value for MTP or ensemble products for future use. 7) Table 2: not clear what "not enough data" is referring to.

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