

Interactive comment on “Correction of real-time satellite precipitation with satellite soil moisture observations” by W. Zhan et al.

Anonymous Referee #2

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The manuscript presents a methodology to correct satellite-based precipitation estimates (TMPA-RT) using a land surface model (VIC) together with assimilation of soil moisture measurements from AMRS-E. This study follows a previous one published in RSE (Wanders et al. 2015) with basically the same co-authors. The paper topic is quite interesting and of interest for HESS. However, it has been really difficult for me to find the new contribution of this study compared to Wanders et al. 2015. Indeed, previous paper investigates various soil moisture sensors (AMSR-E, ASCAT, SMOS) as well as land surface temperatures to correct for precipitation estimates whereas the present paper only focuses on AMSR-E measurements. The only difference I found was related to the precipitation replicates generation which is based on percentiles instead of a random selection from a sampling area of $1.75^\circ \times 1.75^\circ$ around the selected

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location. Based on this, I would recommend the paper to be strongly re-written based on the following comments.

General comments:

- 1) As this paper follows a first study (with potential improvements), a clear reference to the Wanders et al. paper must be done as well as a comparison of the performance of the 2 methodologies. The manuscript should clearly state the originality/novelty of the present paper.
- 2) Globally, there are too much figures and, in most of them, the legend is not clear enough to understand the figures. (cf Fig. 2, 4, 6, 7)
- 3) Figure 5 is useless as it is obvious that after assimilation of AMSR-E into VIC the difference between VIC and AMSR-E should be smaller. Instead of Fig. 5, it would be better to get a temporal graph showing (in one pixel) how the VIC soil moisture simulation is modified after AMSR-E simulation and, how the TMPA-RT precipitation rate is modified.
- 4) Previous paper (Wanders et al.) used quite interesting metrics to assess precipitation estimates (POD, FAR) whereas this one disregards these scores without any explanation.

I would be happy to review this paper on its next submission.

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