

Hydrol. Earth Syst. Sci. Discuss., referee comment RC1
<https://doi.org/10.5194/hess-2021-637-RC1>, 2022
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Comment on hess-2021-637

Anonymous Referee #1

Referee comment on "Characterizing natural variability in complex hydrological systems using passive microwave-based climate data records: a case study for the Okavango Delta" by Robin van der Schalie et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-637-RC1>, 2022

The paper investigates the behaviour of different hydrological and eco-physiological variables in the Okavango River region of Southern Africa. This river has the advantage of being an endoreic basin with a large floodplain at the end of the river. The paper shows a number of differences, particularly between soil moisture products (satellite vs. ERA-5) which are then analysed to show the value of satellite measurements compared to modelling data. The paper is well written and well organised. It does not provide any fundamentally new results but it shows that the lack of lateral influx in the ECMWF (ERA-5) model results in an underestimation of soil moisture and consequently of the ERA-5 evapotranspiration fluxes. The other interest of this paper is to show the evolution over 20 years of the river flow (just before the delta) and the flooded area in relation to satellite measurements of soil moisture, vegetation characteristics and soil temperature. I propose to accept the article with minor revisions.

Minor comments:

Line 143 : indicate millions of m³ instead of Mm³ (or E6 m³). Best would be to indicate also the mean annual river discharge. I guess this is around 300 m³/s.

Line 177: Explain why only descending TB are used in this study.

Line 184: Indicate the AMSR-2 orbital hours (Asc/Desc), same than AMSR-E ?

Line 192: Isn't any local overpass of TRMM closer than AMSR (1:30 pm/am)? Explain

better why 10:30 pm and 4:30 am are the best orbits.

Line 217-220: What does MD means ?

Line 224: Can authors give more details about the "E-type gauge plates" ?

Line 451: It is interesting to introduce a second set of precipitation data (IMERG). However, it would be interesting to show its co-evolution with ERA-PR for example in figure 5. How does the better correlation obtained with PR-E5 indicate a better rainfall product than IMERG?

Line 464: indicate in the figure caption 6 that this is ROI2

Line 533: indicate "(not shown)" after "This for example could also cause the difference in LST-MW and LST-E5 in 2010 and 2011"

Line 554: the end of the sentence is missing.