Hydrology and
Earth System
Sciences
Discussions

Interactive comment on "Comparing soil moisture anomalies from multiple independent sources over different regions across the globe" *by* Carmelo Cammalleri et al.

Anonymous Referee #2

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In the paper titled "Comparing soil moisture anomalies from multiple independent sources over different regions across the globe" authors have investigated the anomaly components of three products and then compared the errors of the standardized products over five different regions. Overall, the manuscript is written well and appropriate to the journal Hydrology and Earth System Sciences. However, there are some parts still need improvement:

- There are other soil moisture inter-comparison studies performed before at global scale, including the ones that have already implemented TCA. First of all authors should explicitly justify the need of anomaly comparisons at large scales (i.e., not per-

formed before over these locations using anomalies?). It is not all that clear what additional benefit do readers get from this study compared to the earlier studies (i.e., the analysis performed here are not performed before?). What is the new thing? Datasets? Locations? Anomaly components investigated instead of entire datasets? The information given in the introductions should better be tied with the overall goal.

- What is the vertical support of the soil moisture product comparison performed here considering modeled soil moisture reflect root-zone while the MODIS LST and ESA CCI soil moisture products reflect the top couple cm depths. How does it relate to the overall framework of the study (agricultural drought monitoring while root-zone soil moisture lies at the hearth of such analyses in general)? Surface skin soil moisture is a good indicator for agricultural drought??

- Percentage error variance information is not all that helpful, perhaps actual standard deviations (volumetric error for the model and satellite soil moisture products and K for the LST product) would be more helpful (i.e., how do these errors relate to specific mission goals of 4%). Or at least authors should justify why presentation of standardized error variance is a better thing to do compared to actual error variance.

- Error variance comparisons of three datasets in space is done, but it would be helpful if more is given.. For example, specific pattern between the error variance and vegetation/precipitation/elevation distributions? Any one better under such and such conditions (instead of only locations)? Why better? A dedicated paragraph would be very helpful.

- Combination of different datasets is spelled out in the introduction (final paragraph where the goal of the study is stated) but not performed (it gives the impression that this study will merge different products; perhaps it should have given all the necessary inputs are available including the error sources of each product).

- Some background discussion about the TCA dataset requirements/assumptions (e.g., length? See Zwieback et al, 2012, doi:10.5194/npg-19-69-2012).

L98: "two folds" L102: "to develop a suitable combination procedure for a near-real time detection of the occurrence of ecosystem drought events".. More specifics. How this will be performed? Using TCA errors to calculate the weights in a merging algorithm? L112: revise "in order to make directly comparable the different datasets"

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