Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2018-546-RC1, 2018

Hydrology and Earth System Sciences
Discussions

Interactive comment on "Evaluation of soil moisture from CCAM-CABLE simulation, satellite based models estimates and satellite observations: Skukuza and Malopeni flux towers regional case study" *by* Floyd Vukosi Khosa et al.

Anonymous Referee #1

Received and published: 28 November 2018

This study is focused on evaluate soil moisture estimations from CCAM-CABLE and GLEAM outputs as well as ESA-CCI product using in situ observations. The writing is good and the paper is readable. While my primary concern is that soil depth for in situ observations is not well consist with either model- or satellite-based soil moisture estimations. Uncertainties from the preprocess as Equ(1) are hard to be assessed, due to propagating surface soil moisture information to deeper soil layers is a very complex procedure and relies on such as soil texture. Given these artificial errors, readers may hard to build their confidence in this study.

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Minors:

1. The authors indicate that this is due to lack of publically available in situ observations in Africa (Lines 81-83, Lines 130-131), yet at least International Soil Moisture Network may provide more abundant observations in Africa. Thus, the authors may want to narrow their study in South Africa, and then revise the related introductions accordingly.

2. Data availability for ESA-CCI product is very low before 2008. While Coverage fractions for model-based simulations are basically 100%. Will data availability differences have impacts on the results?

3. Line 251, given daily (even finer temporal resolution) satellite and model soil moisture, why evaluations are focused on monthly time series?

4. Lines 191-195, indeed ESA-CCI is not the unique blended soil moisture product. The Soil Moisture Operational Products System (SMOPS), for example, also provides an operational global blend of all available microwave soil moisture retrievals on a daily basis (Yin et al., 2015).

5. Section 2.2: which version ESA-CCI data was used in this paper? Line 174-175, CDF-matching to what? Lines 179-186, passive observations are based on radiometer, while it does not indicate passive sensors are only able to take measurements during daylight hours. Besides, whether satellite signals may penetrate clouds fog, vegetation mainly rely on wavelength, rather than what kind of sensors (Wang et al., 1987; Jackson et al., 1989; Wagner et al., 2013).

Kerr Y. H., P. Waldteufel, J. -P. Wigneron, et al. The SMOS mission: New tool for monitoring key elements of the globalwater cycle. Proceedings of the IEEE, 2010, 98(5), 666–687. Wang J R, E T Engman, T Mo, T J Schmugge, J C Shiue. The effects of soil moisture, surface roughness, and vegetation on L-Band emissions and backscatter. IEEE Trans. Geosci. Remote Sens., 1987, GE-25(6): 825–833 Jackson TJ, Schmugge TJ. Passive microwave remote sensing system for soil moisture: some

supporting research. IEEE Trans. Geosci. Remote Sens., 1989, 27(2): 225–235 Yin J., X. Zhan, Y. Zheng, J. Liu, L. Fang, and C. R. Hain. Enhancing Model Skill by Assimilating SMOPS Blended Soil Moisture Product into Noah Land Surface Model. J. of Hydrometeorol., 2015,16(2): 917-931

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