

# ***Interactive comment on “Assimilation of SMOS soil moisture into a distributed hydrological model and impacts on the water cycle variables over the Ouémé catchment in Benin” by D. J. Leroux et al.***

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We would like to thank Anonymous Referee #1 for the constructive remarks, which made this work more thorough. Based on these remarks, the objective of the work has been refined in the abstract and hopefully throughout the whole manuscript. In the original paper, the real-time rainfall products (PERSIANN, TRMM, and CMORPH) are used in the model, which bring too much water. Soil moisture assimilation can attenuate the effect of bringing too much water over the whole basin by correcting the soil moisture content. This positive bias in the real-time precipitation products has already been identified and corrected in reanalyzed datasets: PERSIANN-CDR, TRMM-v7, and CMORPH-v1. When these bias-corrected rainfall products are used, the simu-

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lations are much better and in very good agreement with in situ measurements (soil moisture, water table depth, streamflow). However, these products are only available at least 2 months after the real-time products. The objective of the paper is now focused on a proposition of a fair approach to fill the gap of these few months.

In order to answer properly to each comment, a pdf file is attached and contains the answers point by point after each suggestion. Also, a comparative table of statistic performances between the simulations of streamflow using the real-time (RT) precipitations, from the assimilation of SMOS using the RT precipitations, and from the post-adjusted precipitations is included. They show the interest of SMOS assimilation with real time precipitations. Also a Taylor plot is included.

Please also note the supplement to this comment:

<http://www.hydrol-earth-syst-sci-discuss.net/hess-2015-548/hess-2015-548-AC1-supplement.pdf>

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Precip. Product	R	sdd	bias	rmse	ME
PERSIANN	0.39	292.2	147.2	327.2	-2.45
PERSIANN-CDR	0.78	112.2	-15.6	113.3	0.59
Assim. SMOS	0.78	111.2	4.5	111.3	0.60
TRMM	0.86	120.3	44.4	128.3	0.47
TRMM-v7	0.82	105.2	-15.5	106.3	0.64
Assim. SMOS	0.81	131.4	40.9	137.6	0.39
CMORPH	0.64	356.6	214.6	416.2	-4.59
CMORPH-v1	0.88	85.8	-19.9	88.0	0.75
Assim. SMOS	0.81	134.2	47.8	142.5	0.35

Fig. 1.

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