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Discussions

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Interactive comment on "The value of satellite remote sensing soil moisture data and the DISPATCH algorithm in irrigation fields" *by* Mireia Fontanet et al.

Anonymous Referee #2

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This manuscript aims to explore the value of the DisPATCh product to detect local irrigation. DisPATCh algorithm has been developed to downscale the SMOS data from 40 km to 1 km resolution using MODIS data (NDVI and LST). The approach has been assessed using an extensive ground measurements of surface soil moisture in the Foradada field in northern east of Spain during 2016. The large in situ data set makes part of the merits of this study. However, the authors provide light context and literature review to this research, and its importance. I feel the use of remotely sensed soil moisture to detect irrigation is a hot topic in semi-arid regions. For this reason, the topic of the manuscript is interesting for the readership of HESS. Nevertheless, I found some critical issues that must be addressed before the publication. Please find below

the general comments:

CRITICAL: The manuscript does not read well and it needs to be revised by improving the structure, avoiding repetitions, and by writing symbols, equations, acronyms consistently. Being a scientific paper, the structure has to be clear for the readerships. I found the introduction doesn't flow and lacks background information. Methods/Results/Discussion sections are confusing; methods are scattered throughout the sections and discussion reveals mainly results. Find comments and suggestions in the document attached.

CRITICAL: The authors investigated the spatial variability of NSSM, NDVI and LST. Although, the spatial resolution of LST and NDVI is 1 km (using MODIS dataset), the spatial resolution of soil moisture is few centimeters by using gravimetric measurements. Thus, the comparison does not make any sense and the respective discussion is wrong. It would be interesting to explore the value of DisPATCh and LST for different field scales over large areas, such as the SG region. Or you could explore LST and NDVI at high spatial resolution using Landsat data. Find comments and suggestions in the document attached.

MAJOR: The authors evaluated DisPATCh NSSM using in situ measurements, however this study needs to be fulfilled by a statistical analysis (Correlation, Bias etc . . .). The result section would be improved by adding a temporal description/comparison of NSSM.

MAJOR: I don't think the concluding statement: "DisPACTh algorithm fails to describe the fluctuations in water content caused by irrigation" is correct; the current spatial resolution of DisPATCh might still be too coarse for local irrigation detection. However, DisPATCh succeeded to reveal spatial heterogeneities as rivers, irrigation areas, floods (Escorihuela et al. 2016, Malbeteau et al. 2015 2018, Molero et al 2016). It would be interesting to discuss the value and the limitation of DisPATCh over irrigated area (from local irrigation to large irrigation system). This conclusion needs to be balanced and

the limitation of the analysis performed in this study need to be considered.

MINOR: (1) Figures 1 to 4 need to be improved before publication. I suggest that they can be merged into one figure with two subfigures (figures 2, 3 and 5 into one map + zoom out figure 1 in order to see the coastline and Barcelona). (2) DisPATCh pixels on figure 4 are not squared, any explanation? is it really 1x1 km?

SPECIFIC COMMENTS: You will find comments in the document attached.

Please also note the supplement to this comment:
https://www.hydrol-earth-syst-sci-discuss.net/hess-2018-94/hess-2018-94-RC2-supplement.pdf

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2018-94, 2018.