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Interactive comment on "Evapotranspiration partition using the multiple energy balance version of the ISBA-A-g_s land surface model over two irrigated crops in a semi-arid Mediterranean region (Marrakech, Morocco)" *by* Ghizlane Aouade et al.

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This paper by Aouade et al demonstrates the potential of different complexity of the multi-source approaches to surface flux partitioning. The paper is quite clear and correctly organized. The strategy and methodology are sound. The conclusions are supported by the results. My comments are really minor, mostly related to some editing of the text. The authors did a good job in this submission, I believe. My detailed

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Discussion paper

comments are attached in a pdf.

Please also note the supplement to this comment:
https://www.hydrol-earth-syst-sci-discuss.net/hess-2019-532/hess-2019-532-RC2-supplement.pdf

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Hydrology and Earth System Sciences
Discussions

Evapotranspiration partition using the multiple energy balance version of the ISBA-A-g_s land surface model over two irrigated crops in a semi-arid Mediterranean region (Marrakech, Morocco)

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Abstract. The main objective of this work is to question the representation of the energy budget in surface-vegetation-atmosphere transfer (SVAT) models for the prediction of the convective fluxes in the case of irrigated crops with a complex structure (row) and under strong transient hydric regimes due to irrigation. To this objective, the Interaction Soil-Biosphere-Atmosphere (ISBA-A-gs) based on a composite energy budget (named hereafter ISBA-1P for 1 patch) is compared to the new multiple energy balance (MEB) version of ISBA using two representations of the canopy energy budget: a coupled approach (ISBA-MEB) where the vegetation layer is located above the soil and a patch representation corresponding to two-adjacent uncoupled source schemes (ISBA-2P for 2 patches). The evaluation is performed over a winter wheat field, taken as an example of homogeneous canopy and on a more complex open olive orchard. Continuous observations of evapotranspiration (ET) with Eddy covariance system, soil evaporation (E) and plant transpiration (T_r) with Sapflow and isotopic methods were used to evaluate the three representations. A preliminary sensitivity analyses showed a strong sensitivity to the parameters related to turbulence in the canopy introduced in the new ISBA-MEB version. The ability of the single and dual-source configuration to reproduce the composite soil-vegetation heat fluxes was very similar: the RMSE differences between ISBA-1P, -2P and -MEB did not exceed 10 W/m^2 for the latent heat flux. These results showed that a composite energy balance on homogeneous covers is sufficient to reproduce the total convective fluxes. By contrast, differences were highlighted on the partition of ET. In particular, the ISBA-2P version showed an over-estimation of soil

Fig. 1.