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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Evaluation of land surface model simulations of evapotranspiration over a 12 year crop succession: impact of the soil hydraulic properties" *by* S. Garrigues et al.

Anonymous Referee #1

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Review of the manuscript "Evaluation of land surface model simulations of evapotranspiration over a 12 year crop succession: impact of the soil hydraulic properties" The authors consider the impact of soil parameters (rooting depth, saturated water content, field capacity and wilting point) on the simulation of evapotranspiration (ET) over a 12 year Mediterranean crop succession. The authors compare direct measurement of ET with 5 simulation scenarios (listed in Table 4) and conclude that the most accurate simulation is achieved when soil hydraulic properties are directly derived from the monitoring activity of water content at different soil depths. This manuscript is of potential interest for the HESSD readers but can be published after the following revisions: 1)

the paper is hard to follow, thus it needs strong improvements in the overall presentation. Many parts are redundant, and need to be shortened, simplified and well-stated. Many other parts are confusing. For example, by referring to Table 4, all the different simulation cases have to be clearly explained one by one in Section 4.1 2) the experiments are not well described. More details have to be added. At which depth did you install the 4 neutron probes? Why do you average soil moisture at saturation (wsat) for different field locations if the model refers to an experimental soil profile? Not clear at all. How many samples (and which depth) were collected for the Richard plate apparatus? Explain better point 2 at page 11695: how do you retrieve rooting depth (d2), wilting point (wwp) and field capacity (wfc) from the measurements of the water content values? Can you show a graph where you point wwp and wfc in each growing season (to integrate Table 3)? 3) uncertainty is not properly addressed. It is just qualitative in Section 6. It is mandatory to quantify the uncertainty propagation on ET by running a Monte-Carlo analysis (for example 100 simulations for each case) and plot it (grey lines for all, black lines for the average ET-values). Same for the measured ET through the eddy-covariance. I understand this suggestion requires numerical effort, but the paper would be optimal by presenting this analysis.

MINOR COMMENTS 1) Please use simple (or standard) symbols to avoid confusion: for example LH for latent heat, E for soil evaporation, T for transpiration, θ for soil volumetric water content (w is soil gravimetric water content), θs for saturated water content, Ks for saturated conductivity, Zr for rooting depth (why the subscript 2?), Ks . 2) use same units throughout the manuscript. Be consistent. If the fluxes are in mm d-1, K has to be set in mm d-1 as well. The unit day is set with the letter d. 3) enlarge fonts in the figures, thicken the lines, enlarge the legend

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 11687, 2014.