

Interactive comment on “Land Surface Model Representation of the Mutual Information Context between Multi-Layer Soil Moisture and Evapotranspiration” by Jianxiu Qiu et al.

Anonymous Referee #2

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Manuscript Number: HESS-2019-282 (Jianxiu et al)

I have reviewed this manuscript and I have the following comments.

EVALUATION

This is a well written paper with a clear contribution to ecohydrological modeling and I have very few comments. The first relates to the jargon in the title. Please try to simplify the title for the paper to be appealing to a wider audience. Secondly, the aims and objectives of the paper must be clearly formulated and also indicate what is new or novel about this study and who benefits from it? Lastly, what is the take-home message from this study given that no conclusions are given?

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SPECIFIC COMMENTS

- Keywords: - “surface evapotranspiration” is listed as a keyword/phrase. Delete the word “surface” - Line 27 – indicate that some of the incoming energy is absorbed by the surface. . . given that you are mentioning biochemical cycles in line 30 - There are inconsistencies throughout the paper regarding the evaporation terms. A typical example is in lines 11 to 12 in the abstract where the authors refer to the sensible heat flux and evapotranspiration (ET) in the same sentence. Rather also use the energy equivalent of ET (i.e. the latent heat flux) and be consistent throughout the paper. - Line 59: What is meant by ET entropy? This is not a standard micrometeorology or ecohydrological phrase. Please define such terms. - Throughout the paper rather use the phrase “soil water content” which is more specific than “soil moisture” - Lines 63-64 not necessary - Line 75 sounds rather cyclic, rephrase! - How did you account for the accuracy of the different types of soil water content sensors or their depth of installation across the Ameriflux sites? How does this affect your results? - The vegetation acts as the link between the atmosphere and soil water content in deep soil profiles. Please give more details on how the vegetation types affected your analysis/results. - Line 188: What is the bottom layer soil moisture measurement? Define this, else rephrase. - 2) options for θ factor for stomatal resistance (the β factor). Not clear what this represents. What is a theta factor? What does it do? - and reference soil moisture ($m^3 m^{-3}$), How is this defined? - and reference soil moisture ($m^3 m^{-3}$), Confusion over symbols. Sometimes you mention stomatal resistance, and at other times stomatal conductance; line 142. Choose one and stick to it otherwise this easily gets very confusing. - line 142 – stomatal conductance is not the sole driver of ET. Its more complex than that. Please elaborate - Eqn 6: what does the symbol H mean here? Thought you said H was the sensible heat flux earlier? - Fig 4 these are poor model performances.

Comments end.

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