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Interactive comment on "Simulation Analysis of Local Land Atmosphere Coupling in Rainy Season over a Typical Underlying Surface in the Tibetan Plateau" *by* Genhou Sun et al.

Anonymous Referee #1

Received and published: 1 September 2020

Thanks to the reviewers for their responses and changes to the manuscript. Although some of the reviewer's original concerns have been addressed by the revisions, there are still two areas of the manuscript where the reviewer does not agree that the figures support the explanation/text in their current form.

Author Response 1: Thanks for your comments. The red area in the Fig. 2b) represents lakes in the study area, where the soil moisture is close to 1.0. The soil moisture in other parts of the study area varies from 0.2 to 0.5. This agrees with the soil parameter tables in Noah LSM. We have added this to the Fig. 2. The interactions between the lakes and land surface in the domain 3 are simulated in this study. Because this study

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mainly focuses on the interactions between the land surface and the atmosphere, the simulation result over lakes is not included in the study by discussing the results where the soil moisture is less than 1.0.

Reviewer Response 1: It is clear that the red area represents lakes. The authors state that the rest of the domain varies from 0.2 to 0.5. This is not shown in the figure. There are plenty of gridcells that are light green and yellow. Given the scale presented in the figure, the case could be made that the darker green gridcells are around 0.5, but the bright green and yellow values are certainly greater than 0.5 and they are plentiful. If it is true that these values are not greater than 0.5, then this figure needs to be revised to convey that information. As it exists now, it does not support the text and my previous comments and concerns remain about this derived map and the impacts of it on the simulations.

Author Response 2: Thanks for your comments. The spatial distribution of soil moisture in Fig. 8 shows that the soil is dry in the west and south parts of the study area and is generally wet in the middle and east parts of the study area and the areas close to lakes. The Hsfc in the west part of the study area is higher than that in the east part of the study area except some grids of high altitudes (Fig.1b)). The LEsfc in the east part of the study area is high than that in the west part of the study area. Therefore, it is reasonable to say that the spatial distribution of surface fluxes shows a good agreement of that of soil moisture. For the spatial distribution of surface fluxes, it seems that the altitude in the study area has an influence on the surface fluxes, where the area with high altitudes show high Hsfc and low LEsfc.

Reviewer Response 2: Regarding “Fig. 8 shows that the soil is dry in the west and south parts of the study area and is generally wet in the middle and east parts of the study are and the areas close to the lakes.” The annotated figure showing the areas of low and high soil moisture is appreciated. Although there is slightly more blue (lower SM) in the southern part of the domain as compared to the northern part, it’s still very difficult to see any significant groupings of soil moisture. It would likely help to set the

minimum value of the scale/map to a larger value (e.g., 0.2 rather than 0.1) so that more variation can be identified between 0.2 and 0.3 where most of the values are. As it stands, it still looks as if the domain (aside from the lakes) lacks any coherent soil moisture pattern.

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