

Interactive comment on “Last Decade Progress in Understanding and Modeling the Land Surface Processes on the Tibetan Plateau” by Hui Lu et al.

Anonymous Referee #1

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In this study, the authors reviewed the several progress in the understanding and modelling of land surface processes on the Tibet Plateau in the last decade and summarized the major advances. This manuscript aslo provided the land surface modelling community potential directions of the further improvement of land surface modelling on TP. Overall, ,the paper is well organized and written. I only have some minor comments listed as follows:. ! The advance in the impact of Sub-grid Terrain Radiative effect over TP is missed. References are listed as follows: Gu Chunlei, Anning Huang*, et al., 2020. Effects of Sub-grid Terrain Radiative Forcing on the Ability of RegCM4.1 in the Simulation of Summer Precipitation over China. Journal of Geophysical Research: Atmospheres, DOI:10.1029/2019JD032215. Lee, W.-L., K. N. Liou, and C.-c. Wang (2013). Impact of 3-D topography on surface radiation budget over the Tibetan Plateau.

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Theor. Appl. Climatol., 113, 95-103, doi:10.1007/s00704-012-0767-y.

2. Another missed advance is the Sub-grid orographic drag effect. references: Zhou, X., Yang, K. & Wang, Y. Implementation of a turbulent orographic form drag scheme in WRF and its application to the Tibetan Plateau. *Clim Dyn* 50, 2443–2455 Zhou Xu et al., 2019. Dynamical impact of parameterized turbulent orographic form drag on the simulation of winter precipitation over the western Tibetan Plateau. *Climate Dynamics*, 53:707–720.

3. I think some key lake process parameterizations including the light extinction coefficient, turbulent mixing in deep lakes, lake surface roughness length, and lake ice surface albedo need to be improved based on more field observations in the future LSM developments. These issues are necessary mentioned in perspectives on the further improvement of land surface modelling.

4. As the vegetation types are very sensitive to climate change on TP, the parameterization of dynamic vegetation should be improved further LSM development.

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