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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Variations of surface roughness on inhomogeneous underlying surface at Nagqu Area over the Tibetan Plateau" *by* Maoshan Li et al.

Anonymous Referee #2

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The surface roughness plays an important role in understanding the land surface processes, and the land-atmosphere interactions, which will subsequently impact the land surface heat fluxes and then to the local climate. When putting this topic within the context of Tibetan Plateau (TP), the importance of surface roughness become even more prominent, due to the important role of TP in the formation, outbreak, duration and intensity of Asian monsoon, and in the global climate system. In this study, the author use MODIS satellite data and tower-based atmospheric turbulence observation data to investigate the temporal and spatial variation of the surface roughness. The results show that the satellite-derived surface roughness are consistent with the measurement data. The satellite-based surface roughness were further classified into

different underlying surfaces (Urban, Lush Grassland, Sparse grassland, and ice and snow). The manuscript is well written and organized, it is suggested to clarify some minor comments before its acceptance for publication.

1. The signal of grazing activities should be captured by MODIS. Nevertheless, this is not discussed in the manuscript. Also relevant to this point, the in-situ measurements were taken within the fence, this reviewer is wondering how such differences (within fence no grazing, outside fence grazing) will impact the result and conclusion.

2. Figure 7, the label for x-axis are in Chinese. And it is not clear why a-d, and e-h? What are differences are not clearly explained in the main text.

3. This reviewer is also curious how the outcome of this research can be taken up by land surface modellers in terms of calculating land surface heat fluxes. Could the authors help detail a bit the discussion here?

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