

Atmos. Chem. Phys. Discuss., referee comment RC2
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Comment on acp-2022-451

Anonymous Referee #2

Referee comment on "An assessment of land energy balance over East Asia from multiple lines of evidence and the roles of the Tibet Plateau, aerosols, and clouds" by Qiuyan Wang et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2022-451-RC2>, 2022

This paper assessed the land energy balance over East Asia with surface measurements, satellite estimations, reanalysis and CMIP6 products. The author found a substantially larger fraction of atmospheric shortwave radiation of 5.2% is reflected and a slightly smaller fraction of atmospheric shortwave absorption of 0.6%. The author also investigated the cloud radiative effects and found the presence of clouds results in a larger cooling effect on the climate system over East Asian land than that over globe. The author also pointed out the role of Tibet Plateau in both SW and LW radiation balance.

The paper addresses an important and interesting topic, and I believe that this paper have the potential to be of great value to the scientific community. However, I have several concerns as outlined below. After addressing these concerns, I believe the work would be a good fit for publication.

- The topic of this paper is land energy balance over East Asia and the role of TP, aerosols and clouds. The author analyzed the cloud radiative effects in section 5. However the author did not outlined the importance to study cloud radiative effects. I suggest to expand the discussion on the cloud radiative effects in introduction to emphasize the importance of authors analysis.
- This paper is lack of the discussion on the radiative effects of aerosols.
- Why the surface sites are divided into rural/urban categories? Is this related to surface properties or aerosol or both? Please explain.
- Table 1, the land-atmosphere net heat flux is worth known.
- Table 2, 17.2 W m^{-2} could be a large difference, the percentage-wise is worth known.
- Line 602-613, "Comparisons.....OLR of 2.7%", I suggest to show the the spatial distribution of CRE from reanalysis or satellite estimations or CMIP6 over East Asia in section 5 and the spatial distribution of net heat flux (from ERA5 or CMIP6) to support this conclusion on the role of TP.