

Interactive comment on “A revisit of parametrization of summer downward longwave radiation over the Tibetan Plateau from high temporal resolution measurements” by Mengqi Liu et al.

Anonymous Referee #2

Received and published: 23 June 2019

The parameterizations used to calculate DLR are pretty outdated, as stated in the introduction and other places in this study. One question is that the empirical parameterizations, for example those used in this study, are strongly dependent on locations and time and thus might be suitable for specific locations and seasons but not for others. As the authors stated in introduction ‘Understanding of complex spatiotemporal variation of DLR and its implication is essential for improving weather prediction, climate simulation as well as water cycling modeling’. The empirical parameterizations are apparently not able to obtain complex spatialtemporal variations of radiation flux. Actually,

C1

an accurate radiation transfer model would be a better choice to calculate radiation flux. Cloud optical properties, especially cloud optical depth is critical to modulate radiation flux, which unfortunately has not taken into account in this study. Also, a simple way is used to calculate cloud fraction (equation 1) in the manuscript, so it is necessary to evaluate the calculated values with the observed ones at the meteorological site over TP.

Minor comments: The references cited in introduction are pretty outdated. Are there any updated references on such kind of studies? Line 185-186: it is better to give an equation on how to calculate DSR. Line 189-192: how to deal with aerosol (concentrations, vertical profile, scattering and absorption, etc.) in your calculations? some details are better provided. Line 193-194: ‘The terrain reflection is estimated according to Dozier and Frew (1990)’, again please give some descriptions on how to estimate surface albedo. Line 197-199: give some description on why use these values as surface albedo, are they from surface measurements? Line 200: why scaled DSR to 1400W m^{-2} , DSR is net downward shortwave radiation, rather than total solar radiation.

In addition, the paper would be greatly enhanced with additional proof reading to improve the quality of the written English.

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2019-397>, 2019.

C2