Hydrology and Earth System Sciences Discussions

Hydrol. Earth Syst. Sci. Discuss., referee comment RC1
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Comment on hess-2021-305

Anonymous Referee #1

Referee comment on "Improved parameterization of snow albedo in Noah coupled with Weather Research and Forecasting: applicability to snow estimates for the Tibetan Plateau" by Lian Liu et al., Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2021-305-RC1, 2021

The widely used Noah land surface model coupled with WRF shows obvious defects in simulating the land-atmospheric interaction during snow events over the Tibetan Plateau. The author effectively improves the Noah snow albedo parameterization scheme by using the remote sensing albedo products and considering snow depth as an additional factor, and significantly enhances the performance of WRF coupling with Noah in land-atmospheric interaction estimations during eight snow events. This work is irreplaceable and of great scientific significance. This improved snow albedo scheme has a good application prospect on the high elevation areas. Several comments are listed as follows.

- This study select eight different intensity of snow events to evaluate the universal applicability. It is enough, but why you choose these snow events?
- The snow albedo parameterization scheme is referred to Oerlemans and Knap (1998). What changes have been made in this albedo scheme used in snow events over the Tibetan Plateau.
- The improved snow albedo scheme shows much better performance in land-atmospheric interaction simulations at fine resolution such as 1 km. This study configures five snow events with 1 km resolution simulations, and three snow events with 5 km resolution simulations. Why not configure all the snow events to 1 km resolution?