

Hydrol. Earth Syst. Sci. Discuss., referee comment RC1
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Comment on hess-2021-134

Anonymous Referee #1

Referee comment on "The value of water isotope data on improving process understanding in a glacierized catchment on the Tibetan Plateau" by Yi Nan et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-134-RC1>, 2021

Comments on Nan et al. "The value of water isotope data on improving process understanding in a glacierized catchment on the Tibetan Plateau"

Water isotope data have long been recognized to have potential value to hydrological process understanding. However, its potentials have seldom been explored in high mountainous areas, where proper understanding on the complicated hydrology is of critical importance for future projection on hydrological conditions. This paper tries to investigate the value of water isotope data on improving process understanding in a glacierized catchment on the Tibetan Plateau. The authors developed a tracer-aided hydrological model and adopted a long time series of water isotope data to feed the model to quantify the runoff components and MTT/MRT. The results shows that the developed tracer-aided hydrological can substantially reduce the simulation uncertainty with the aid of precipitation and streamflow water isotope data. At the same time, the method adopted in the paper can estimate the MTT/MRT in a reasonable accuracy, which opens a new window to understand the hydrological processes in the plateau area. The paper is well structured and the language is well written. I strongly recommend its publication on HESS after properly addressing the following comments.

General comments:

- MTT and MRT are useful terms to understand hydrological processes in a catchment.

The authors discuss the values of MTT/MRT. More discussions on the influencing factors are encouraged.

- The seasonal contribution of water sources is an important result, but the values are quite to identified from Fig. 5, better to show the result by a table. It would also be better to show the result of seasonal contribution of surface and subsurface runoff to better understand the seasonal runoff regimes.
- In the multiple-objective calibrations, the NSEdis and MAESCA, MAEiso were added directly. Better to clarify the influence of calibration objective function on the result.

Minor comments:

1.The abstract must be concise, summaries the research aims, methodology, results and discussion, and conclusions. This lacks in your abstract.

2.The conclusions should be brief and more informative. Please cut down the conclusion to a short paragraph.

3.May consider the subscribe "N" to "S" to represent snow for quicker understanding.