Comment on hess-2022-25

Anonymous Referee #1

Referee comment on "Changes in nonlinearity and stability of streamflow recession characteristics under climate warming in a large glaciated basin of the Tibetan Plateau" by Jiarong Wang et al., Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2022-25-RC1, 2022

In cold alpine regions, climate warming has changed infiltration and hydraulic connectivity due to accelerated glacier melting and permafrost thawing as well as significant glacier and permafrost retreats. It should later the hydrograph pattern including the recession process. Authors analyzed the temporal changes of the recession parameters of a and b in the Brutsaert and Nieber equation in terms of the daily observed discharge during 1980–2015 in the Yarlung-Zangpo River basin (YRB). They obtained interesting results that a decreased and b increased with air temperature rise, meaning increase of nonlinearity and decrease of stability for the streamflow recessions in most sub-basins of YRB due to climate warming. This finding will benefit to establish a method for hydrological prediction and baseflow analysis in cold watersheds.

The manuscript was well-written and easy to follow. It is acceptable for publication after minor revisions.

Since changes of a and b values are highly related to the enlarged groundwater storage or soil active layer thickness, I suggested that authors to clearly state the physical bases of the changes of a and b. I also suggested to explain how the driving forces or changes of soil active layer thickness lead to the initially fast decline of recession (ascribed to the increased b) and finally slow decline of recession (ascribed to the decreased a). I believe these explanations could strengthen the manuscript quality.

Minors

- the decrease of log(a) means the decrease of recession rate and thus increase of the

streamflow stability, right?

- Line 100. "…, mean annual temperature varies from -9.3 to 22.0 â□□". Is it right the annual temperature could as high as 22.0 â□□ in the basin?
- Line 104. "Groundwater accounts for about 54% of the annual streamflow". References are needed.
- Fig 3. There is a mistake for the range of mean daily precipitation.