Comment on hess-2021-376
Anonymous Referee #3

Referee comment on "Evaporation, infiltration and storage of soil water in different vegetation zones in the Qilian Mountains: A stable isotope perspective" by Guofeng Zhu et al., Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2021-376-RC3, 2021

General Comment

This paper presents an interesting hydrological and runoff study from the Qilian region where water and soil water samples were obtained across different climatic, topographical and vegetative conditions in order to understand the infiltration, evaporation and storage processes. The paper is well structured, but major issues need fixing as also suggested by the other referees. Overall, the English language needs to be proofread and words such as "obvious" should be avoided. The Abstract needs substantial work to emphasize the purpose/objectives of the study, describe the methods used, and to relate quantifiable results. Further discussion of the results themselves is required as well as linking the results obtained (what are the observations withdrawn from the data) to previous research. Please see additional comments below.

Abstract

L11-12: Is this really true? That in arid areas most of the water comes from mountains? How about low lands? And groundwater? I think this sentence is not needed.

L12: should be the “processes” not “process”

L13: “have” instead of “has”
L15: instead of “In current study” use “In this study”

L15-17: This is an important sentence that summarizes the work done. I would suggest to rewrite it being more specific to which isotopes, which types of vegetation zones and why this is needed.

L17: Weak compared to what? Results should be quantified instead of using “weak” and “save up”

L19-21: What is the result in the paper that lead to this hypothesis? The authors need to add evidence of this instead of speculating

L22: What is evaporate strongly? How much?

L21-22: The lower elevation vegetation zones within the Mountain Grassland and Deciduous forest? Aren’t these areas at high altitude?

L25: Delete word “reasonably”

Introduction

L39-40: Soil water in the unsaturated zone from precipitation can transform into water vapour or groundwater recharge.

Line 40: Delete “Its”

Line 41: Delete “very”

Line 48: Storage is not a transport mechanism

Line 54: is it soil water profiles?
Line 56: Delete “In addition,”

Line 58: Describe what the d-excess is

Line 86-70: Delete “, and” and rewrite following sentence. It is not clear at the moment.

Line 71: Do not use “Generally speaking” in a scientific publication

Line 71: Do “wet” areas refer to tropical regions?

Line 80: can better help adapt

Line 82: “In this study” instead of “In current study”

Line 82: “,” after soil water

Line 83: Is it in four regions of different climate, vegetation and topographical conditions? As opposed to vegetation zones?

Line 85: Then, it can be clarified that this study explores how evaporation, infiltration and storage processes differ within these four regions according to the climate, vegetation and topography.

Line 89: similarly to the previous comment, are the authors restricting the analysis to only vegetation zones? I would argue that the study compares regions with varying climatic, topographic and vegetative conditions.

Study Area

Line 99: ranges between 2000m and 5000m above sea level
Data and Methods

L110: Delete “and determination”

L116: What does “parallel” mean here?

L170-172: Equation before line 170 needs reference

Results and Analysis

L175: “PET” should be written Potential evapotranspiration (PET), then the authors can use PET but it needs complete spelling the first time it is used.

L177: I assume it is also the daily evapotranspiration? Need to make it explicit which type of evaporation

L184: Delete “generally speaking”

L191: “temperature” instead of heat

L194: 72 precipitation events? Make it explicit, where all these rainfall?

L207: Rewrite sentence to “The temperature of the studied regions was ordered as follow:”

L208: Define first what AM, CF, MG, and DF mean

L213: Do not use obviously in scientific publications, you can say what it was significantly different? Did you do any statistical analysis to conclude this? If so what please mention it in the results
L211-220. This info would be better in a table.

L235: “The low temperature environment of Alpine Meadow and abundant and uniform precipitation events made the monthly mean values of δ2H and δ18O change little” how much?

L239: “Evaporation fractionation of soil water isotopes in Coniferous Forests was more intense.” More intense than what? These kind of statements need quantification.

L277-278: “With the decrease of altitude, the soil water evaporation became stronger and stronger, except soil in Deciduous Forest”. This sentence does not make sense, please rewrite and quantify stronger.

Discussion

I am in agreement with the comments of Referee 1 and Referee 2 concerning the discussion. It feels more like a summary of previous studies. The authors need to refer to the results and put them in context of previous work and how their study is contributes to that pool of knowledge.

L323-325: “The soil water storage capacity of Alpine Meadow with low temperature and rainy weather was obviously higher than that of other vegetation zones.” The authors need to explain how this conclusion is evident from their data without using words such as “obviously” referred to figure 7 for discussion.

L440-442. Fix this sentence grammatically

Conclusion

L457: Storage capacity decreased (instead of weakened)

L461: Soil “water” evaporation in spring...

L463: Is it “isotopic” instead of “isotopci”? 
L463-465. This sentence needs fixing. I could not understand what it conveys.