

Comment on hess-2022-4

Anonymous Referee #3

Referee comment on "Inter- and intra-event rainfall partitioning dynamics of two typical xerophytic shrubs in the Loess Plateau of China" by Jinxia An et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2022-4-RC3>, 2022

The present work collected very detailed data to conduct a concurrent and in-depth investigation of throughfall (TF), stemflow (SF), and interception loss (IC) at both inter- and intra-event scales for two typical xerophytic shrubs on the dry region in the Chinese Loess Plateau, and the effects of bio-/abiotic factors were investigated. Previous publications from some of the same authors (Yuan et al., 2019, HESS) and the other researchers (Zhang et al., 2018, Science of The Total Environment; Yang et al., 2019, Journal of Hydrology etc.) only focused on TF or SF in shrubs, and the most of rainfall partitioning investigations are limited at inter-event scales. The intra-event rainfall partitioning dynamics which could help have a better understanding of soil water replenishment and its distribution in soil and the key ecohydrological cycle in arid regions have been rarely explored. As far as I know, this study is the first time to investigate the intra-event variations of all the rainfall partitioning components (i.e. TF, SF and IC) for shrubs. This is the main novelty and a step forward compared with the previous related studies (Yuan et al., 2019, HESS; Yuan., 2017, HESS; Yang et al., 2019, JH). This study obtained new insights to understand the fine characterization of shrub-dominated ecohydrological processes, and improve the accuracy of water balance estimation in dryland ecosystem. The paper is well written and interesting to the general readers of HESS, and I think it can be published in HESS. I have the following comments to further improve it.

- The authors should explain explicitly the novelty of this study, especially how it advances from Yuan et al. (2019) and Zhang et al. (2018).
- Compare your stemflow data with that reported by Yang et al. (2019) in Journal of Hydrology for the same shrub species.
- The authors selected three representative shrub plants to investigate inter-event rainfall partitioning. Eight TF manual gauges were placed under each *korshinskii* plant, and for *S. psammophila*, twenty TF gauges were placed under each plant. For SF yield, a total of 53 branches of *C. korshinskii* and 98 branches of *S. psammophila* were used. Compared to the thorough measurements at inter-event scale, the measurements at intra-event scale were somewhat limited (four TBRGs (tipping bucket rain gauges) for intra-event TF, and four TBRGs for intra-event SF). I know it is mainly due to high cost

of equipment, and it is difficult to place a lot of TBRGs to measure intra-event rainfall partitioning. The authors should discuss this issue.

- Some newest references are lost from this paper, such as "Yue et al., 2021, Global patterns and drivers of rainfall partitioning by trees and shrubs, *Global Change Biology*". The authors should check it.
- Whether the rain ended at daylight hours or at night? How long after the end of rainfall to collect throughfall in TF manual gauges? The effects of relevant evaporative losses in TF manual gauges should be discussed, as they are open to atmosphere as shown in Fig. 1b.
- Line 49, transpiration should be evaporation.
- While describing the intra-event rainfall partitioning dynamics, the authors should elaborate more on its potential ecological significance.
- The authors did not express clearly whether the 38 rainfall events were all rainfall events in 2014-2015 rainy seasons or those producing throughfall and stemflow.
- The authors should describe the relationships between intra-event rainfall partitioning variables and meteorological factors such as wind speed and wind direction, even there were no significant relevance.
- The possible limitations of your study and the future research focus are suggested to be included in the final section the Discussion part.
- In some references, the authors' first and last name is incomplete. Please revise.