

Hydrol. Earth Syst. Sci. Discuss., referee comment RC2
<https://doi.org/10.5194/hess-2022-88-RC2>, 2022
© Author(s) 2022. This work is distributed under
the Creative Commons Attribution 4.0 License.

Review of hess-2022-88

Anonymous Referee #2

Referee comment on "Landscape structure and rainstorms swing the response of recession nonlinearity" by Jun-Yi Lee et al., Hydrol. Earth Syst. Sci. Discuss.,
<https://doi.org/10.5194/hess-2022-88-RC2>, 2022

This overall well written paper intends to relate the classical a and b recession parameters to stream network, rainfall and antecedent moisture conditions. As discussed in the review by Anonymous Referee #1, there is a methodological problem: the presented analysis investigates the relationship between the marginal distributions of the parameters and possible explanatory variables, i.e. the analysis omits that a and b are not independent; a solution would be to first model the relation between a and b but as far as I see from fig. 5, there is no evident relationship between a and b.

Besides, it is unclear what the main contribution of the paper is beyond a state-of-the-art case study (which is probably not enough to justify publication in HESS). A clear presentation of what we could learn from a case study in the selected hydroclimatic area would be of key importance. The paper would also strongly benefit from a concise synthesis of known factors influencing recession properties and a better justified selection of the potential explanatory variables that are retained.

For all above reasons, I suggest rejecting the paper.

Detailed comments:

- There is a lack of references for the theoretical aspects of how recession properties depend on landscape properties
- There is no discussion of active drainage density (the actual drainage network can vary strongly seasonally)
- the literature review should be improved; the previous findings are summarized but not yet synthesized; we also do not know where the previous work has been done (catchments size, climate, region etc); is this study the first in a tropical area?

- When talking about travel times, it is important to be more specific whether this is in the channelled or the unchannelled state (i.e. in-stream or in the hillslopes), (e.g. Rinaldo et al., 2006)
- 1: attention some units are wrong, the same units should be on both sides of the equation
- There are not enough details on how the explanatory variables of Table 1 are computed for the 260 events (what is total precip, what is Q_{tot} (including or excluding baseflow?), how is peak flow identified if there are several peaks etc. etc.)

- Rinaldo, A., Botter, G., Bertuzzo, E., Uccelli, A., Settin, T., and Marani, M.: Transport at basin scales: 1. Theoretical framework, *Hydrology and Earth System Sciences*, 10, 19-29, 2006.

-