

Comment on hess-2022-2

Anonymous Referee #2

Referee comment on "Flood generation: process patterns from the raindrop to the ocean"
by Günter Blöschl, Hydrol. Earth Syst. Sci. Discuss.,
<https://doi.org/10.5194/hess-2022-2-RC2>, 2022

This paper provides an excellent timely review on runoff generation processes at different spatial scales and their links, with a focus on flood phenomenon. The continuous spectrum of flood generation process is separated into 5 distinctively representative scales, i.e., pore, profile, hillslope, catchment, region, and continent, with a total of 10 order of magnitude. The inherent interaction at the lower scale leads to emergent behaviors at the high scale, which can be universally described as preferential flow and threshold behavior. The implications of scale transition for hydrological modeling are also deeply discussed. All in all, this review is of great importance to the hydrological community in both process and modeling fields. I recommend its immediate publication after some minor revisions to address the following comments.

- Introduction part, Ln33: the fatal flood event occurred in July 2021 in Henan Province of China is worthy to be mentioned, with a total death of over 300.
- Conclusion part, Ln366: 'connectivity' is considered to be universal at all scales which control where flow paths connect and thus the overall behavior of the system. However, it is not obvious at the continental scale. At this scale, the author revealed preferential path of atmospheric storm dominates the flood generation. How 'connection' presents itself at this scale is not obvious. More explanation will help readers for a better understanding.