Hydrology and Earth System Sciences Discussions

Hydrol. Earth Syst. Sci. Discuss., community comment CC1
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Comment on hess-2022-418

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Community comment on "Throughfall spatial patterns translate into spatial patterns of soil moisture dynamics – empirical evidence" by Christine Fischer-Bedtke et al., Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2022-418-CC1, 2023

The authors collected an extensive dataset, i.e., throughfall and soil water contents on a 1□ha temperate mixed beech forest plot in Germany 2015 - 2016 during the growing seasons in independent high□resolution stratified random designs, to investigate the effect of throughfall spatial heterogeneity on the soil water response and check which other factors modify the result. The method is reliable, the result is interested, the conclusion is significant after thoroughly discussion, such as throughfall spatial patterns leave a stronger imprint on soil water dynamics than on soil water content per se. I recommend the manuscript can be published by the international journal after minor revision.

Throughfall, also called net rainfall, is a part of gross rainfall after vegetation modification. Simply, it sources from gross rainfall. However, in your linear mixed effect models to evaluate the influence of potential drivers explaining soil water content or soil water content increase, gross rainfall was removed due to strong correlation with mean throughfall. I think you neglect the most important factor of soil water content. Please the authors consider it with alternative method. Such as in your equation 1, you used median of throughfall to calculate the normalized value of the spatially distributed measurements of throughfall. I recommend you can use gross rainfall instead of median of throughfall to calculate it, you can refer to Zhang et al. (2016) and Zhao et al. (2019).

I think the manuscript is long, some contents can be deleted or moved to supplementary, such as L268-274, only retain direct relevant contents. Also, the Abstract is long, need to be condensed.

Soil water content or soil moisture has a unified call in the full text. Also, the unit of soil water content should be used m3 m-3 instead of %.

Many long sentences, such as L85-87, L97-100. The language needs to be polished.

Zhang et al. (2016) Gross rainfall amount and maximum rainfall intensity in 60-minute influence on interception loss of shrubs: a 10-year observation in the Tengger Desert. Scientific Reports, srep26030.

Zhao et al. (2019) Rain shadow effects of individual shrub related to crown shape in arid desert. Ecohydrology, e2076.