

Hydrol. Earth Syst. Sci. Discuss., community comment CC1  
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## Comment on hess-2022-186

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Community comment on "Technical note: How physically based is hydrograph separation by recursive digital filtering?" by Klaus Eckhardt, Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2022-186-CC1>, 2022

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A very long time ago (in 1991) I published a review of hydrograph separation methods. The review had been requested for a meeting of the British Hydrological Society. It included a section on Choosing a Hydrograph Separation method. That section consisted of a single word: "Don't." The reason for that was mostly to avoid the types of problems represented by this paper - particularly the inference that some mathematical filter can be used to decide what is groundwater or not. The author appears to think that baseflow and groundwater are equivalent. This is particularly ironic when he references the use of tracer information to support the lack of a time delay in his own function on the basis that tracers show that there can be "a rapid release of so-called pre-event-water". But just why should that pre-event water be baseflow (or groundwater)? The tracer data generally undermine the whole idea of baseflow separation. To suggest that something might be physically-based by comparing one mathematical function to another mathematical function based on a linear store is surely naive at best, and downright misleading at worst. We might perhaps want to use a consistent mathematical filter to produce some "baseflow index" as a characteristic of catchment response but please do not relate it to any superficial process interpretation. Better still, please do not choose a baseflow separation method at all but try to understand the actual processes of catchment response.

Reference.

Beven, K.J. (1991), Hydrograph Separation?, Proc.BHS Third National Hydrology Symposium, Institute of Hydrology, Wallingford, 3.1-3.8.