

Hydrol. Earth Syst. Sci. Discuss., community comment CC2
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Reply on AC1

Keith Beven

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-CC2>, 2022

OK, I will accept the argument that physically-based can be defined in terms of mathematics derived from explicit assumptions and you are certainly correct about the technical note. I am not in any way disputing that, only the utility of such analyses. The danger, as ever, is thinking that those assumptions represent the actual physics of the catchments we are interested in, as you seem to do when you equate baseflow and groundwater, and when you invoke tracer evidence for fast groundwater responses when surely that very information suggests that contributions of pre-event water are quite different from baseflow defined by those mathematics. That therefore suggests to me that the assumptions of the mathematics are wrong in terms of being a physically-based description of the actual processes. So create a baseflow index if you wish, but please do not call it groundwater (or even better, explicitly differentiate them to avoid others making a similar false equivalence).