Review of the manuscript HESS-2022-186

The technical node entitled *"Hydrograph separation: How physically based is recursive digital filtering?"* brings some clarifications on the physical basis of recessive digital filters and more specifically to the Eckhardt (2005) recursive digital filter. More importantly the technical note provide one approximation of the so-called BFI_{max} parameter that is needed to apply the filter. The paper is well written and really clear from the beginning to the end. I just miss some clarifications and improvements that could facilitate the reading of this paper for a more general audience. I suggest accepting the paper with the following minor comments.

Generic comments

1. I feel like the introduction is oriented toward advanced users of recursive digital filters and especially the Eckhardt (2005) filter. I would appreciate having some examples of recent applications of the filter to underline how it is used in different contexts.

2. In section 3.1, I would rather prefer a discussion about the consequences of such an assumption (i.e., the short time delay between recharge and baseflow) and thus to what extends (hydrogeological contexts) the application of the recursive digital filter is restricted in respect to the physical meaning developed in the paper.

3. In section 3.2, equation 11 is given to provide one approximation of BFI_{max}. Groundwater recharge is needed to estimate the parameter. This makes sense since, for low storativity aquifers, baseflow is highly correlated to recharge so estimation of recharge would provide a good approximation of baseflow. However, I feel like using groundwater recharge to estimate such a parameter is just moving the problem to another problem. But I see the benefit of this approximation to validate BFI_{max} estimates or to provide a first estimation of this parameter in a given context.

Specific comments

Line : 21-22 : Not clear to me what the author wants to say with this sentence. Please clarify

Equation (2) : Although A and B are described in Eckhardt 2005, might be good here to recall their meanings. This will prevent readers to read the original publication to follow the reflection.

Line 147: I miss some explications on how the author stands that a 40% recharge error will not lead to more than 10% of uncertainty in baseflow.