

Hydrol. Earth Syst. Sci. Discuss., referee comment RC1  
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## **Comment on hess-2022-201**

Ty P. A. Ferre (Referee)

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Referee comment on "Frequency domain water table fluctuations reveal impacts of intense rainfall and vadose zone thickness on groundwater recharge" by Luca Guillaumot et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2022-201-RC1>, 2022

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I enjoyed reading this paper. It was a pleasure to see that the famous Ploemeur site continues to contribute fundamental insights! The approach is both novel and thoughtful. The authors do an excellent job of presenting their findings and also addressing potential limiting assumptions that underly the analyses. I am convinced that they have demonstrated that their approach offers a useful way to understand how precipitation and evapotranspiration are modified within the vadose zone to produce recharge. My only suggestion is that the authors may help readers to see the underlying approach and to understand the significance of the work with a couple of schematic diagrams and some added background explanations. For example, given that the method is heavily reliant on frequency domain analyses, it may be useful to show the power spectrum of recharge at the two sites and to describe it in terms that a general reader can appreciate. Later, this could help to explain, again at a more intuitive level, how the method filters the effects of pumping and leads to the conclusions regarding the contribution of P-ET to recharge at different frequencies. I would also have appreciated a paragraph to explain the coherence and transfer function results. Can the authors help the average reader to make sense of these so that they can appreciate the results that follow? Finally, I would recommend that the authors provide some thoughts on the applicability of the method to a broader range of sites. Is it, for any reason, limited to fractured rock settings? Does it require a highly instrumented site with a long record? What practical benefits might other researchers and practitioners realize if they apply this approach at their site? All of this is simply aimed at broadening the impact and readership of the work ... the underlying science was a pleasure to read!

Best

Ty Ferre