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Hydrology and Earth System Sciences
Discussions

Interactive comment on "A nonparametric approach toward upper bounds to transit time distribution functions" *by* Earl Bardsley et al.

Anonymous Referee #4

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This is a resubmission of a previusly submitted manuscritpt on the same topic. The paper has been modified to include nonstationarity and expand the reference section. With these respects, the paper certainly does a better job than the previously submitted paper. However, I'm still a bit puzzled by this paper and his relevance for the hydrologic community, for the following reasons.

HESS is an hydrological journal, which is mainly read by hydrologists. Therefore, I think the author should do much more efforts to better convey his message to the hydrological community. The language, the way of presenting, the discussion of the implications of the findings are a bit technical and maybe somewhat at odds with the literature on the topic. Honestly, it's really difficult to grasp the relevance of this work for the hydrological community given the example presented in the paper. The author is firm in suggesting

that there is no hydrological modeling in the paper, which is good. On my side, as an hydrologist, I have to say that I had really hard time in understanding what is going on in this paper. Using dimensionelss quantities instead of physically-meaningful variables (concentrations, times, etc) and working only with synthetic examples that have nothing to do with real world hydrological systems does not help. I think the only way to be more convincing about the usefulness of his approach is to apply the framework to real world concentration data (there are freely available datasets on the web), and provide upper bounds of travel time distributions in contexts where you have to face data gaps and limited timeseries, and in cases previous estimates of mean travel times and travel time distributions are available. This is not to state that there is no value in the procedure. However, I think the application of the theory to reality would definitely offer the opportunity to explain the method and its potential much better, and show its advantages with respect to other low-complexity parametric approaches allowing the estimate of travel time distributions based on hydrochemical data.

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