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Interactive comment on "Influence of measurement errors on the results of the Brutsaert–Nieber analysis of flow recession curves" *by* Jacek Kurnatowski

Anonymous Referee #1

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This paper presents a recession analysis to estimate bucket model parameters under the assumption of error in the rating curve. The paper may provide some interesting results, but it needs serious revisions.

1) The methodology is sometimes difficult to follow. For example, I could not see how the "bias for the linear reservoir yields Equation 8", or what leads to Equation 9, etc. I suggest the steps from one equation to another be made more explicit.

2) The analysis is based on the assumption that the error occurs in measuring the stages, and that such errors are IID with zero mean and constant std. This is a strong assumption that deeds argumentation and subsequent discussion. It should be dis-

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cussed that errors come from different sources, including e.g. errors in the model inputs, or model structural errors.

3) It is unclear how the fit of Figures 5 to 9 is obtained. If this is obtained by standard least squares, it should be noted that this approach assumes that the errors of ln(-dQ/dt) are iid normally distributed. I am not sure whether this is consistent with the previous assumption of error in the rating curves.

4) Note the previous work of Kirchner, J. W. (2009), Catchments as simple dynamical systems: Catchment characterization, rainfall-runoff modeling, and doing hydrology backward, Water Resour. Res., 45, W02429, doi:10.1029/2008WR006912. This is highly related to the current paper and not discussed. E.g. this paragraph "Brutsaert and Nieber [1977] used plots like Figure 6 to define the lower envelope of dQ/dt as a function of Q, under the assumption that these points would be least affected by evapotranspiration, but in practice, much of the spread in dQ/dt at any particular value of Q may be due to stochastic variability and measurement noise [Rupp and Selker, 2006a], particularly over the short intervals between individual hourly measurements."

5) In terms of structure, the introduction must be more focused (e.g. it is unclear how the presentation of linear vs nonlinear debate is related to the paper; objectives must be better specified), there should be a separation between results and discussion, and the conclusion needs to report relevant findings rather than elements of discussion.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2018-413, 2018.