Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2019-550-RC2, 2019

Hydrology and Earth System Sciences
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Interactive comment on "Technical Note: A two-sided affine power scaling relationship to represent the concentration–discharge relationship" *by* José Manuel Tunqui Neira et al.

Anonymous Referee #2

Received and published: 17 December 2019

General comments The manuscript on "A two-sided affine power scaling relationship to represent the concentration-discharge relationship" introduces an interesting alternative to conventional power law relationships. By using an additional degree of freedom the new approach is more flexible to relate concentration to discharge. It seems that better results compared to the conventional power law can be achieved especially when concentration variation is large. If my suggestions can be considered sufficiently I would like to support acceptance of the manuscript for publication.

Specific comments Line 50, Table 1: use mg S L-1 instead of Smg L-1, more over the coefficient of variation could be added to give a simple measure for the variation

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within the data set, although the less often used (q90-q10)/μ) statistic is already presented but without mentioning it in the manuscript anymore. Line 143 ff: the use of the NSEB criteria reduces the sensitivity of this objective function compared to the original NSE. If the concertation variability is small compared to the discharge variability solute loads are highly controlled by discharge. Therefor combining concentration with load objective function will further reduce the sensitivity of these criteria in those cases. To provide a most transparent evaluation I suggest to provide all five given criteria separately not only in the calibration mode but also in the validation mode. Line 169, Table 5: I would suggest to provide the mean concentration of the solutes in the table although they have been provided already in table 1 making the assessment of the RMSE easier Line 187, Table 6: here all five introduced evaluation criteria should be given to allow an assessment of the new approach in more detail, e.g. distinguish between concentration and load calculations. Line 187: It seems that the new approach has especially advantages if the variability of concentration and probably also discharge is large. If this is the case this would allow for a more detailed discussion of the advantages and possibly also limitations of the new approach.

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