

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

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Dear Referee,

Thank you for the review. I refer to particular issues raised by you as follows:

1. “The methodology is sometimes difficult to follow. . .”. Well, I guess this is the result of the imperfections of a good part of authors which follow their own thoughts and think that everyone should keep up with them. In terms of gaps between particular equations – e.g. Eq. 8 is created by substitution of Eq. 4 to Eq. 7 etc, but I understand that these transformations require more precise explanations. While working with the next version

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of the paper I shall take care of that.

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 needs argumentation and subsequent discussion. It should be discussed that errors come from different sources, including e.g. errors in the model inputs, or model structural errors”. In my opinion this is the simplest assumption which can be made in relation to the measurement errors. Any other assumption, e.g. concerning asymmetry of errors, would be risky and, as you have stated, require justification. A separate problem is, however, the PDF for this error. The normal distribution is commonly used as a standard pattern here so I decided to use it as well although I am not convinced about the full correctness of this. The error of river stages measurements may result from many factors, including even such trivial reasons like cleanliness of a gauge rod etc., but the main reason is waving due to wind, in particular when measurements are carried on in the simplest way, i.e. by watching the water level position at a rod. On the other hand the amplitude of waving during the measurement observation is limited and considering the error beyond this limit not necessarily has to be justified. This was the reason of my assumption about the beta (bounded domain) distribution of errors as an alternative PDF. In terms of different sources of errors – considering raw data only the errors may appear as a result of additional processes which have not been considered in an analysis. I am fully aware of that so I do not state that the scattering of points in BN77 results only from measurements, but this kind of errors should be analyzed first. The errors quoted by you are the ones related to modeling procedures and not to measurements, so cannot be discussed while analyzing errors affecting raw data sets.

3. “It is unclear how the fit of Figures 5 to 9 is obtained. . .”. Yes, you are right, I should present the algorithm in a form of consecutive steps and I shall do it.

4. “Note the previous work of Kirchner, J.W. (2009). . .”. Indeed, during the literature analysis I did not consider some important papers including the Kirchner’s one. These

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works are important to the point that I decided to rework the introduction and insert a separate discussion of papers dealing with the influence of errors on the analysis results. I hope that the final product will be deprived of the existing shortcomings in this respect.

5. "In terms of structure, the introduction must be more focused...". Well, I shall consider this. I will probably have to give up a part of the introduction and change the rest, albeit with regret.

Anyway, thank you very much again.

Sincerely,

Jacek Kurnatowski

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