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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Technical note: Pitfalls in using log-transformed flows within the KGE criterion" *by* Léonard Santos et al.

J Ding

johnding_toronto@yahoo.com

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A graphical illustration

It's most gratifying to read the positive response from the authors to my suggestion of looking at a classical RoSR (i.e., ISR, the inverse square root) transformation.

Their discussion paper has appeared at a most opportune time, as I have ready a slide presentation on the Budyko evapotranspiration framework. This happens to include an illustration of the log- and RoSR-transformations of a dry weather flow hydrograph.

Two of these slides are shown here, Figure 9 and (Section) 7. In the latter, the storage exponent N appears in a nonlinear storage-discharge relation, $Q \sim S^N$.

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Discussion paper

PS. I could supply my own 1966 ASCE discussion paper which should be available on an inter-library loan as I used to know. But I think it'll be worth their while to get and read a complete set of the referenced works. They can view my "Johnny came late" contribution in the context of the development of prevailing scientific thoughts. For example, why the Box-Cox (1964) transformation has gone mainstream in hydrology, but the ISR (1964-66) has not, as if some of us hadn't tried or hard enough. More food for thought.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2018-298, 2018.

Figure 9. Observed hydrograph and the transformed recession hydrographs for Crnojevica Spring, Bosnia and Herzegovina. (Source of flow data: Bonacci, 1993).

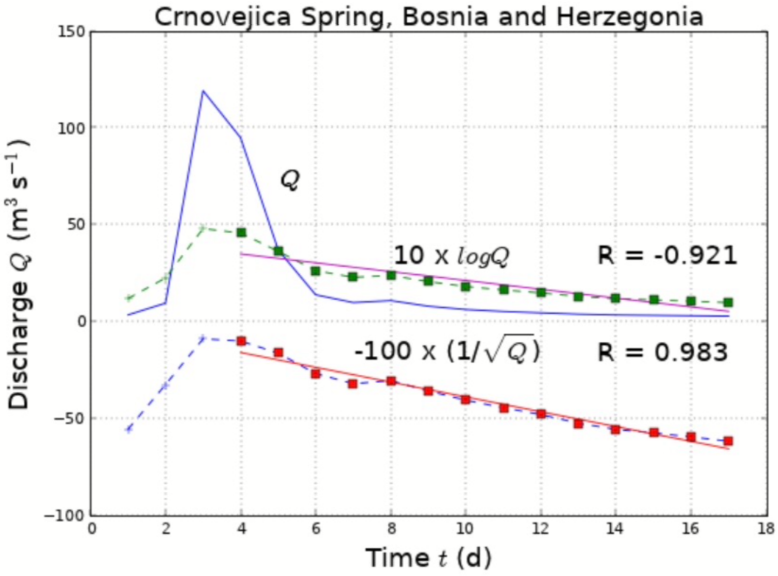

Fig. 1.

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7. The storage exponent N - an example

Figure 9 is an example for Crnovejica Spring, Bosnia and Herzegovina. It shows the observed hydrograph (Bonacci, 1993). In addition, it shows the log- and RoSR (Reciprocal of the Square Root)-transformed recession hydrographs. The corresponding storage exponent values are $N = 1$ and $N = 2$.

For clarity, the ordinates of the log-transformed hydrograph (shown in green squares) are multiplied by a factor of 10, and those of RoSR one (in red) by that of -100.

For log and RoSR transform, the **correlation coefficient**, slope and intercept of the best-fit line are (-**0.921**, -0.228, 4.380) and (**0.983**, 0.038, 0.009), respectively. The RoSR transform thus fits the recession limb better than the log-transform.

Fig. 2.

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