Hydrology and
Earth System
Sciences
Discussions

Interactive comment on "Technical Note: A measure of watershed nonlinearity II: re-introducing an IFP inverse fractional power transform for streamflow recession analysis" *by* J. Y. Ding

Anonymous Referee #1

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Thank the author re-introduces the forgotten IFP transform method. This IFP transform of the BN model converts recession segments to a linear recession time series. This technical note is interesting. I have some comments for the consideration of the author.

The author argues that the advantage of the IFP transform is time-scale invariance, and the data clouds of $-dQ/dt \sim Q$ are affected by Δt for computing $-dQ/dt$ and Q. A demonstration of this will be appreciated.

From Table 3, it seems that correlation coefficient, if it is used for evaluate the perfor-

mance of the model, is not sensitive to the value of b.

Lines 11-17 on Page 15661: The reason of the lower envelops are used includes: given a flow rate Q, the lower envelop is associated with minimum recession rate (-dQ/dt). The recession rate from groundwater discharge is minimum compared with discharge from other components such as surface or subsurface runoff.

Lines 9-10 on Page 15665; Lines 23-24 on Page 15666: I am not convinced that b should be less than 2. Is it for late recession?

Lines 24-28 on Page 15668 and Table 3: From Table 3, the correlation coefficients of "RoQ" for event 0 is 1.00. Does this mean that the model with b=3 is also good for the recession events? Lines 9-12 on Page 15669: Why is the upper limit of b value is 2? From the IFP transform, the coefficient of RoQ for events 0, 1, and 2 are same as that of Recip or RoSR.

Line 7 on Page 15669: "Its transformed slope is independent of the size of time step. . ." It is not clear how this conclusion is made.

One of the advantages of the BN method is for aggregating ensemble of recession segments. Then the recession parameters are estimated based on these recession events using the lower envelope.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 15659, 2013.