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Interactive comment

Interactive comment on "Technical note: Comparison between two generalized Nash models with a non-zero initial condition" *by* Baowei Yan et al.

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The authors compare apples with oranges. They derive a solution for a continuous-time system where the inflow rate is an analytical function. The Discrete Linear Cascade Model they compare their solution to, on the other hand, is for a system where the inflow rate is sampled at discrete time intervals (dt). This means that the inflow rate is available as instantaneous values only, separated by dt intervals. Between the instantaneous measurements, the inflow rate is either assumed (as no information is available) to keep the last measured value (i.e., pulsed data-system) or is considered as linearly changing between subsequent measurements. The solutions of the DLCM, discussed in length in Szilagyi-Szollosi-Nagy (2010) therefore are the exact solutions under the practical conditions of discrete sampling of a continuous variable/signal (i.e., streamflow rate). The authors' claim therefore that the DLCM solutions are only approximate is erroneous and misleading and shows a complete lack of understanding the difference between a continuous and a discretely sampled signal/system. While the DLCM solutions were worked out for the specific practical situation of discretely sampled flow rates, encountered at any hydrological forecasting service (such as the National Hydrological Forecasting Service of Hungary, where the model has been in operational use for more than 30 years), the analytical solution the authors derive is useless for such purposes, as the different-order time-derivatives required for their solution are simply non-existent for such discretely sampled signals, made up of piece-wise straight [joint or disconnected (the latter for pulsed data)] line-segments. I have explained this for the authors several times before as a reviewer of their manuscript that they had submitted to HESSD this time.

References: Szilagyi J., Szollosi-Nagy, A. (2010). Recursive streamflow forecasting: a state-space approach, CRC Press, Taylor & Francis, Boca Raton, FL, USA, pp. 195, ISBN 978-0-415-56901-9.

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