

Interactive comment on “Hydrograph separation: an impartial parametrization for an imperfect method” by Antoine Pelletier and Vazken Andréassian

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We would like to thank Dr Y. Mei for his question. It is an opportunity to illustrate the algorithm behaviour.

Two update mechanisms are present in the algorithm: an upward one and a downward one. The upward update occurs once a year, where measured streamflow reaches its yearly minimum; but the downward update occurs on a variable number of time steps, when computed baseflow is greater than measured streamflow.

For the three example hydrographs shown in the article, we counted the average num-

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ber of time steps in which the reservoir level is updated each year through the downward update mechanism: 3.5/year for Vair river, 4.2/year for Virene river and 4.8/year for Petit Thérain river. Such a small sample does not allow to conclude to a general increasing trend with BFI, only that we have on average around 4 updates per year. We think that it is a reasonable number that supports the validity of the model, as highlighted by Dr. Y. Mei.

The figures below shows the location of time steps where the reservoir level is updated. Downward updates are mainly located during low-flows that follow a quick recession after the high-flow season. It is used by the model to adapt to a particularly quick decrease of measured streamflow, quicker than the response of the quadratic reservoir.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2019-503>, 2019.

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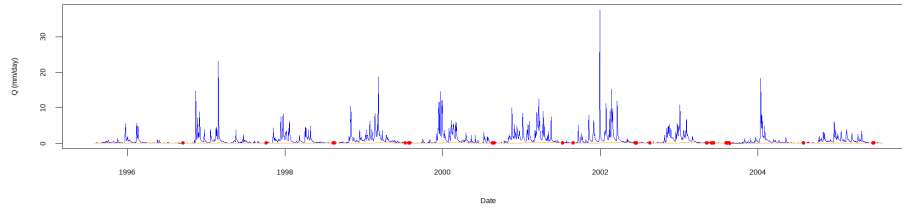


Fig. 1. Separated hydrograph of Vair river in Soullousse-sous-Saint-Élophé. Red dots are points in which the reservoir level is updated.

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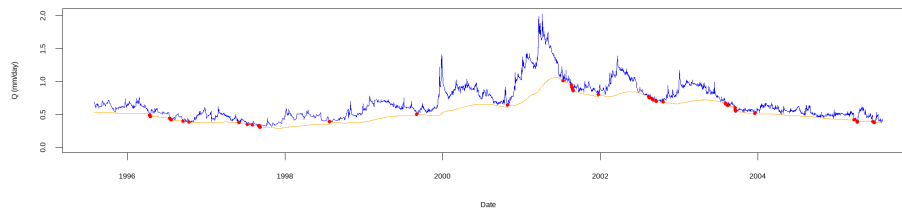


Fig. 2. Separated hydrograph of the Petit Thérain river in Saint-Omer-en-Chaussée. Red dots are points in which the reservoir level is updated.

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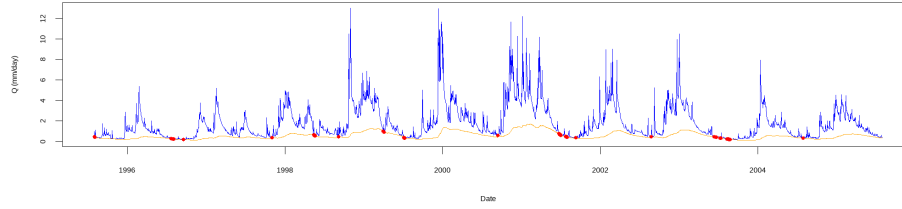


Fig. 3. Separated hydrograph of Virène river in Vire-Normandie. Red dots are points in which the reservoir level is updated.