

Interactive comment on “Cascade of submerged reservoirs as a rainfall-runoff model” by Jacek Kurnatowski

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Dear Sir/Madam,

Thank you very much for your comments and remarks. Generally, I cannot disagree with the majority of them. In particular, I am fully aware of the limited applicability of the SC2 model, although, in my opinion, the usefulness of SC2 to surface runoff cannot be arbitrarily disregarded. You are also right with the statements that the model is (or maybe) too simple to spatially differentiated /rasterized catchments. On the other hand, some simplifications of any model structure are unavoidable sometimes and the well-known problem of seeking the rational equilibrium between the accuracy, simplicity and universality of a model invariably matters. I do not claim a too large universality of SC2 since as a new concept it should first of all be tested with the proper carefulness and in

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accordance with the rules of mathematical models development. I can express a hope that this model will be tested in the foreseeable future not only by me.

The problem of hysteretic behaviors of modeled phenomena – in my opinion, such problems do not require nonlinearity of models arbitrarily. I can imagine the effect of hysteresis modeled e.g. by variations of storage coefficients (simplified as discrete in time, otherwise such a model would be nonlinear, of course). This is far-reaching future for me, considering the present state of the SC2 model development and testing.

Your suggestion concerning the sensitivity analysis is very valuable and I shall take care of that.

Integer versus non-integer number of reservoirs – the Nash model allows to introduce the non-integer number of reservoirs due to the fact that the factorial of number of reservoirs $n!$ appearing in the hydrograph formula can be replaced by gamma function $\Gamma(n)$ being the continuous generalization of the factorial. The SC2 model does not have such a possibility, unfortunately.

Language – I am sorry, my English can be surely polished up as I am not a native speaker. Nonetheless, I am confused a little bit since the word “researches” appears in the whole paper only twice (taking no account to the proper noun of one Polish institute) and in “Conclusions” once. Of course I can replace it by e.g. “analysis”. I promise that before final submission I shall spare no pains in order to smooth up the entire text.

Yours faithfully,

Jacek Kurnatowski

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