

Interactive comment on “Simulation of high mountainous discharge: how much information do we need?” by B. Schaefli and M. Huss

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Numerics of GSM-SOCONT

As discussed in the recent work of Clark and Kavetski (see Clark and Kavetski, 2010; Kavetski and Clark, 2010a,b), many conceptual rainfall-runoff models use poor numerical techniques, which might produce artefacts during model optimization, especially for daily or larger time steps. In particular, the widely used explicit Euler scheme is highly likely to lead to badly behaving state variables and to wrong posterior parameter distributions. Kavetski and Clark also deplore that most publications about such models (including the present manuscript) do not give any details about the used numerical schemes.

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GSM-SOCONT uses a fixed daily time step, an implicit Euler scheme for the glacier part and a 4th order Runge-Kutta scheme to solve the slow reservoir store for runoff production on the non-glacier part.

We will mention the numerics in the revised version.

References

Clark, M. P., and Kavetski, D.: Ancient numerical demons of conceptual hydrological modeling: 1. Fidelity and efficiency of time stepping schemes, *Water Resour. Res.*, 46, W10510, doi:10.1029/2009WR008894, 2010.

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