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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Complexity and performance of temperature-based snow routines for runoff modelling in mountainous areas in Central Europe" *by* Marc Girons Lopez et al.

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In attach some specific comments of Valentina Premier Ph.D. working with me.

The paper applies some modifications on the snow routine of the HBV model. Main results are that an increasing complexity does not lead to increasing performance. The most positively influencing modification is the use of an exponential snowmelt function and of a seasonally variable degree-day factor. Some comments follow: - Line 15-17: "However, [. . .] support tool" This sentence is not really clear to me. In general, I would restructure the abstract making clear from the beginning that the investigations are performed among snow routines based on temperature-index methods only. - Line 34:

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Discussion paper

"... often triggered by raising temperature". Is the main triggering source induced by air temperature or by incoming solar radiation, which is well represented by temperature? - Line 64-66: "Regarding the proportionality constant ..." Is the constant catchment defined? Are there studies which take into account of the spatial variability (e.g. different altitude, topography, etc?) - Line 66-67: ".. one for temperature and another for net radiation". Doesn't this belong to the hybrid methods? - Line 115 Formula (3) Is T the daily average temperature? Some formulations take into account the cumulated temperature which exceeds the threshold, measured for example with 1 hour time step. Would these different formulation affect the results? - Section 2.2.1 Has the formula (5) been evaluated by using the available temperature data for the studied catchment? - Paragraph 2.2.5 What is the threshold used in the model as the maximum liquid water content retained in the pores (maximum water retention capacity)? - Section Results. I would plot the performance vs size of the catchment and altitude (also for a fixed configuration, given the high number of variable components).

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