

Interactive comment on “Modelling the water budget and the riverflows of the Maritsa basin in Bulgaria” by E. Artinyan et al.

Anonymous Referee #1

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Review of “ modelling the water budget and the riverflows of the Maritsa basin in Bulgaria ”

This paper is written as a detailed report on the application of a coupled large-scale hydrological and SVAT model (ISBA-Modcou); it therefore is very complete in terms of input/output data analysis, but lacks a scientific discussion thread; the paper should be rewritten so that one scientific issue is tackled: the authors should clearly state what is the specific scientific question posed behind the sole ISBA-Modcou implementation. If not, it is not clear in what aspect this application is different/innovative compared to previous applications of the ISBA-Modcou framework.

I suggest to split the paper in two parts: one should be converted into a technical

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memorandum of the NIMH detailing the gathering of all input data and presenting the description of the outputs that are not directly relevant to the chosen scientific objective, and the second, referring to the memorandum, should be the HESS paper itself with a specific scientific approach, incl. a statement of the scientific objectives that the authors want to achieve (assumptions/materials and methods/results).

It seems to me that the most interesting development of this study is the modification of the slow flow component and the spatialized calibration of this add-up. In that case the paragraph concerning flow delay should be largely expanded: what are the processes involved ? How does one know the extent and intensity of each process ? How does it translate into the modelling choice that has been made ? Why using 2 reservoirs for the slow component ? How does it interact with the VIC model ? etc In that respect the conclusion that the inclusion of this 2-compartements scheme improves the simulation is not supported by the available information. I suggest this improvement could be used as a guideline for the paper.

Another concern is the lack of evaluation data; although validation at such a large scale is difficult to achieve, local measurements have little representative value (e.g. soil moisture) and in this study streamflow is the only integrating/large scale “validation” variable. The discussion section should mention this, and at least propose alternative methods to check the relevance of the complex model used in the study. For instance, one could imagine an evaluation of the evolution of snow covered areas or surface temperature patterns with low resolution remote sensing to better constraint the realism of the modelling framework. Low resolution remote sensing data is free of charge and easely accessible nowadays.

The paragraph on energy balance could be shortened, because it is purely descriptive in absence of evaluation methods.

Details:

Page 482 line 2: the 2 layer scheme is already describing an unsaturated zone; specify

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that you want to describe “an unsaturated zone below roots”. What I do not understand is that it seemed to me that this unsaturated zone below the root zone is the third layer of ISBA-3C. please comment on that.

Page 484 line 2: how is T_c calculated ? Be more specific

Page 485 line 12: provide reference for albedo/min. stomatal resistance table

Page 486 line 1: provide reason for using eq. 3; impact of such a choice ?

Page 486: provide reference on software Bluepack;

page 490: "validation": I'd rather use the term "evaluation"

Page 491 par 5.2: this paragraph is not clear and should be rewritten (both the parameter specification procedure and the statistical calibration procedure are difficult to understand); you calibrate the slow flow model, not the reservoirs; how do you define the dry period of the year ?

Page 492 first par.: expand the description

page 521: what happens to the energy balance in april 96 ? It sounds that $R_n - G < H + LE$

Table 5: what is “W&B” ?

the quality of the english should be improved

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 4, 475, 2007.

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