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Interactive comment on "The Latest Improvements in SURFEX v8.0 of the Safran-Isba-Modcou Hydrometeorological Model over France" *by Patrick Le Moigne et al.*

Anonymous Referee #1

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This paper presents an analysis of a number of improvements to a land surface model. I do appreciate the amount of work the authors have performed, but at this point I also have a number of major comments to the paper.

- A first problem is the quality of the writing. There are a large number of grammatical errors that many times make the paper very hard to read. This renders the paper unacceptable for publication.

- Top of page 2: There is a vast amount of literature on the evaluation of land surface models at various spatial scales using Bowen ratio or eddy covariance data (latent and sensible heat fluxes), ground heat flux data, soil temperature and moisture profiles,

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Discussion paper

infiltration data, ground water levels, etc. Similar comparisons have been performed using remote sensing data. Stating that models have been evaluated using discharge data and ground water levels is blatantly ignoring an enormous amount of literature.

- We need more information on how the point data were upscaled to allow comparisons with the model grid results. Comparing point data to spatially averaged model results does not make much sense. Furthermore, some grids may contain more stations than others. This will impact the results of the comparison, and needs to be explained better.

- Please make it crystal clear how the 470 discharge stations were selected. If there are more stations, why were they not used?

- Line 351: some basins are anthropized. I assume this means "urbanized", because agricultural crops are now in the new vegetation classes. If basins are urbanized or semi-urbanized, and the model does not simulate this, then these basins cannot be used to evaluate the model.

- Line 417: "can probably be attributed to a deficit in the incoming shortwave ration ... or geothermal heating". This seems speculative, it could simply be that the soil or land cover parameters are wrong.

- Section 4.7: remote sensing data could have been used to substantiate the results here. At this point, unless I am misunderstanding, no data are used to validate the conclusions.

In the light of these comments I unfortunately cannot recommend the paper for publication in a highly esteemed journal like GMD.

Some minor issues:

- Add units to the list of numbers at the bottom of page 3.

- Top of page 4: be specific, do not state "few tens of centimeters" and "a few meters".

- Line 215-220: this explanation is very unclear.

- Section 4.7: Bowen ration -> Bowen ratio.

- There are 17 figures in the paper. This seems like a bit much to me. Can this perhaps be reduced?