

12.05.2023

This review is for the manuscript: "Multi-model approach in a variable spatial framework for streamflow simulation" by Cyril Thébault, Charles Perrin, Vazken Andréassian, Guillaume Thirel, Sébastien Legrand, and Olivier Delaigue.

This is a well written paper. For a large sample, 121 catchments in France, different combinations of model structures, calibration strategies, and spatial frameworks are tested. The amount of data, results and analysis is substantial. I believe the topic is of interest to the hydrological community, and that the paper contributes to the research and practical application of modelling approaches to improve streamflow simulations.

**I have only minor comments.**

**Page10. Line245**

The split-sample test was used, and calibration applied to the two separate time periods. Did you then use two different parameter sets and two different evaluation periods for each catchment?

**Page11. Line251.** The use of streamflow transformation is set to +0.5, +0.1 and -0.5. Could you please explain what this means and why these numbers were selected? Experience, other?

Figure 3: I find this figure very informative and helpful. Return to it several times.

**Page14.** Figure 6, right panel

Am I right that positive values are lumped better than semi-distributed? It was a bit difficult to grasp from the y-axis information.

Could that be stated in the subtitle or perhaps put "median ( $KGE_L - KGE_{SD}$ )" as label on the y-axis?

**Page17.** Figure 11

It was difficult to see the thin grey lines. Especially for the printed version. Is it possible to make this a bit more visible.

**Page25.** Figure 19

Include the total number of catchments in the figure text. (Why not 121?)

It would be nice to include the -0.01 line in the plot, referred to in L515.

And I totally agree that it would be very interesting to see how this approach would apply to catchment with a steeper gradient/elevation and snow.