

General comments

Most of my concerns from the original submission have been addressed satisfactorily. The current manuscript is good work, and I enjoyed reading it. I recommend that this manuscript be considered for publication after minor revisions to make some small but important improvements that would greatly improve the clarity of the manuscript.

Your response 11: You write that “This approach allowed the integration of the SNOW17 model with the GXAJ model to form the GXAJ-S model for calculating snowmelt runoff in grid cells, ensuring that no new parameters were added to the GXAJ-S model compared to the GXAJ model.”. Would it not be clearer if you expressed this as “compared to the GXAJ model, no new parameters were added to the GXAJ- component of the GXAJ-S model”? This would imply that all additional complexity in GXAJ-S is compartmentalized in the -S part only, which is my understanding of your work.

Your response 10: It is still not clear to me which parameters you calibrated in your study, and which you used a fixed value for. In L384-386, you state that SNOW17 has 4 parameters that must be calibrated, and 6 that do not have to be. However, in Table 2 you list a “prior range” for 9 of these parameters, with the word “prior” implying that you calibrated all 9 of these to yield a posterior value. In Table 1 it appears that all of the listed parameters are calibrated because you use the phrase “prior estimate”. Please indicate in Table 1 and Table 2 which parameters you calibrated from the field data, and which parameters you used certain values for without any calibration.

Model comparison: I suggest including a table with the computational time (including both the calibration time and actual simulation time) of simulating a comparable scenario for all 3 models GXAJ, GXAJ-S, and GXAJ-S-SF. That would provide readers with a more complete information on which model to choose. The additional physical detail of GXAJ-S-SF may not be necessary in some applications that prioritize fast computation over accuracy.