

Interactive comment on “Large watershed flood forecasting with high resolution distributed hydrological model” by Yangbo Chen et al.

Anonymous Referee #1

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In this work, a physically based distributed hydrological model was used for flood forecasting in a large watershed to validate the feasibility of distributed hydrological model's application for large watershed flood forecasting. The research objective is significant. A suitable revision is needed before it can be accepted for publication by HESS, and the following comments below should be addressed: 1. It is insufficient that discharge from only one station were used for validation in such a large watershed with 58270 km². Because the same effect may come from different combinations of parameters, more hydrological variables need to be checked seriously. Hence, it is suggested that validation with more observation at different river locations in the area should be added or that spatial observations, such as evaporation and soil moisture from satellite data, could be utilized for check the model performance in this large watershed. 2. In section “Parameter optimization”, some are unclear. Are the parameters of PSO fixed for

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once? What is the objective function? As the paper tells it is set to minimize the peak flow error, but from the Fig 4(c), the peaks have not yet been captured well enough. The result of optimization could be not the real optimal. More trainings are needed. In addition, Nash–Sutcliffe coefficient may be more suitable for the objective function. 3. How did the simulation consider the reservoir regulation in the work? 4. The authors compared model performance with model resolutions at 200m, 500m, 1000m. Although the result is significant, it is better to add some comparisons with model resolutions with smaller interval, such as 300m or 400m. This manuscript does not explain the reason why this work has just chosen those model resolutions. 5. In this paper, the abstract should be more concise and the motivation is not very clear. 6. From line 116 to 133, the related works should be classified and then summarized concisely. 7. If this work did not modify the Liuxihe Model published in the previous works, I suggest section 3.1 and 3.2 should be merged into one part. The description of the model could be reduced. Some contents in Section “introduction” and 3.1 are repeated. 8. The coordinate information in the maps of Fig. 1-3 and Fig. 6 should be displayed. The plotting scales should be the same for all maps. 9. The font in some figures should be accord with that in the manuscript. The units in some figures look unprofessional. For example, in Fig. 4(c), the title of the x axis should be “date” without unit. 10. The trend lines in Fig. 5 and 7 are not clear, especially during the flood. All the plots should be rearranged in the panels.

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