

Geosci. Model Dev. Discuss., referee comment RC1
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Comment on gmd-2021-120

Anonymous Referee #1

Referee comment on "A physically-based distributed karst hydrological model (QMG model-V1.0) for flood simulations" by Ji Li et al., Geosci. Model Dev. Discuss.,
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The paper concerns a topic consistent with the aim of the GMD journal, and I really appreciate the huge work made by the authors. The presented analysis and model application could be potentially useful in karst basins. In this study, a karst hydrological model, i.e., the QMG model-V1.0 was developed for karst floods simulation and forecasting. The model itself is a valuable improvement, and what interested me was the applicability of the model in karst areas, so I went through the entire process of modeling and validating the model myself (<https://zenodo.org/deposit?page=1&size=20>), and the model simulation results were satisfactory. I think the subsequent research should focus on the validation study of the model in more karst areas to prove its general applicability in karst hydrological forecasting. However, there are few drawbacks affect the manuscript and have to be addressed before the paper can be published in GMD.

Specific comments

1) English needs modification

I found several incorrect words, grammar and unclear sentences, make it very difficult to understand the analysis carried out and the results obtained. The authors need to carefully correct the language errors in the whole text.

2) More information about the potential of this new model, ie.e., the QMG model-V1.0 for application in karst areas needs to be added in the Introduction part, especially the advantages and disadvantages compared to current numerical karst groundwater models.

3) In the Methodology part, the section 3.1 Hydrological model, this title is inappropriate here, as it obviously also includes the Parameter Optimization in Section 3.2 and Model Setting in 3.4. Suggest changing it to a model framework and algorithm.

4) In section 3.3 Uncertainty Analysis, it is not clear how to analyze uncertainty in input data and model structure for this new QMG model-V1.0.

Other minor comments

- 1) All tables should be set to three-line tables.
- 2) The right side of Figure 3 seems to be a photograph, please explain the necessity of its existence.
- 3) Each variable in Figure 5 needs to be clearly labeled as to which parameter it refers to.
- 4) The horizontal axis in Figure 7 represents the date, but the interval is not one-to-one with the marked time, please check that.