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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Real-time reservoir flood control operation enhanced by data assimilation" *by* Jingwen Zhang et al.

Anonymous Referee #1

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The article describes a decision support system for the real-time operation of water reservoirs. The system, named ROMEDA, integrates some methodologies that are well established in the water management area, namely optimization and data assimilation. While the topic is probably of interest for this community, I found the paper to be very weak.

The first important problem is the lack of novelty: the problem of integrating optimization algorithms in decision support systems has been tackled for decades—with the rationale, as rightfully pointed out by the authors, of aiding decision-makers, rather than controlling reservoirs in a fully automated fashion. There are indeed many tools that can tackle reservoir operation problems, such as HEC-ResSim (US Army Corps

of Engineers), MIKE HYDRO Basin (DHI), or FEWS (Deltares). Importantly, all of these tools integrate optimization algorithms with different kinds of hydrologic-hydraulic models. Some of them, such as FEWS, use Data Assimilation routines. Therefore, I think that ROMEDA does not represent a step forward in the domain of decision support systems.

Another problem is the way with which the manuscript is conceptualised. I think any reader would expect to see a demonstration of the decision support system, with emphasis on a comparison with the "human's mental model" vaguely mentioned by the authors in the Introduction (see Figure 1). Instead, the manuscript shifts its emphasis on the methods underpinning ROMEDA, which, as mentioned above, are not novel.

I also have a gripe about the experimental setup, which is not clear, transparent, and reproducible. If the goal is to carry out a comparison between human operators and ROMEDA, I would then expect to read a detailed explanation of the operators behaviour (or of the rules that they must follow), rather than the confusing description provided at the beginning of Section 4. Unfortunately, the quality of the presentation is not a problem limited to Section 4, but an issue spanning across the entire document.

My suggestion is to decline the manuscript.

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