

Interactive comment on “HESS Opinions: Advocating process modeling and de-emphasizing parameter estimation” by A. Bahremand

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Author's interactive reply to Prof. Montanari's referee comment

I would like to thank Prof. Montanari very much for his constructive comments and his valuable support for the ideas expressed in the paper. His comments make it clear for me convincingly how to improve the paper. The referee kindly has also given me the direction where and how to work on. Such clear review with solution is very much appreciated. I fully agree with everything mentioned in the referee comment. Therefore, I am going to consider them all in the final version of the opinion paper (if the editor gives me the opportunity to revise the paper). However, I listed all the plans for how to consider Prof. Montanari's suggestions in the paper:

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1. I accept that I have been pessimistic in my paper. I have exaggerated where talking negatively about optimization. Prof. Montanari has explained where the paper sounds pessimistic and has given me some suggestions (organized in 3 paragraphs), I will do all of them accordingly. This means that in page 12380, a third step (c) will be added to the two already mentioned steps (a and b). So, the workflow is going to have 3 steps including the manual trial and error calibration. I agree with the referee with the importance of manual trial and error to find reasonable initial parameter values. This also makes it clear that I believe in some calibration. Modeling as simplification of reality cannot become free from calibration. But I believe, calibration can become limited significantly.

2. I accept that my statement on automatic calibration is overly pessimistic. It happened as a reaction to see many students have focused on auto calibration programs such as SUFI-2 and PEST. But, I do believe that even we can do auto calibration in a reasonable manner. As Prof. Montanari has mentioned automatic optimization has several advantages, therefore in the final version I will discuss those advantages “including the possibility of checking several combinations of plausible parameter values that would be impossible to manually try”, etc. I am grateful to the referee that has mentioned 3 or 4 advantages for auto optimization. From the current version the reader might think that automatic optimization is useless, which is not.

3. As Prof. Montanari has mentioned some publications as examples of incorporating physical knowledge into hydrological practice and optimization, by citing some more examples I will try to take a more optimistic approach with respect to the current state and practice of hydrological sciences and publications. His opinion on this matter as the chief editor of WRR is obviously much more realistic, fair and accurate, and very much appreciated.

4. I fully agree with the referee stating “the presence of uncertainty means that a perfect model in hydrology may not be a realistic target”. It is unrealistic and unreachable. But even knowing this target is unreachable (as I have mentioned it in the paper too), it can

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still serve us greatly. It is like shooting at a still target than a moving one. I recite the last sentence of the opinion paper here: "Although such a target, might seem unreachable, it could at least act as a beacon for hydrologists". In my opinion 'going toward such unreachable but certain targets' is a common practice in human life. However, while revising the work, the paper can become more explicit on this.

At the end, again I thank Professor Alberto Montanari for his support and for the constructive comments. All his suggestions will be included in the final version.

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