

## ***Interactive comment on “Stochastic rainfall analysis for storm tank performance evaluation” by I. Andrés-Doménech et al.***

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I wish to thank very much Dr. Uijlenhoet for the very accurate review he provided. Indeed, Dr. Uijlenhoet rightly stressed a concept that probably was not discussed enough in the paper. The specific question raised by Dr. Uijlenhoet reads: "... the manuscript does not provide a very compelling case for simplified stochastic models allowing analytical treatment and why they would be preferable over more elaborate (but perhaps more realistic) numerical modeling approaches".

It is true that today's availability of computing power allows one to apply sophisticated numerical models which provide a more detailed representation of the involved hydrological processes. It is also true that analytical models (stochastic models in our case) are unavoidably based on simplified assumptions, that are introduced in order to

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be able to analytically derive the probability distribution of the hydrological variable of interest. These assumptions imply that concerns may arise about results' reliability.

However, we believe derived distribution approaches still present the unvaluable advantage of allowing us to better understand how the system works and therefore to understand whether the right result is obtained for the right reason. Numerical models, which often involve a large number of parameters, also involve considerable uncertainty and present to the user just the final result, very often preventing a full understanding of the process and an effective check of the results' reliability. Even if powerful computers are today available, we believe it is still very important to understand why the computer provides a given response. To this end we believe analytical models are a very helpful tool.

We are not saying that analytical models should be always preferred over numerical ones. In our paper we present a comparison with the results of a simulation study just because we believe that, ideally, the two approaches should be coupled. In our case, a coupled application allowed us to check the results of both methods. The analytical model allows us to perform a check of the output of the numerical study, while this latter allows us to check that the assumptions conditioning the analytical study are justified. Within this type of approach, we believe the analytical model we proposed is an effective tool, which proved to be reliable in comparison with the more detailed simulation model.

I believe that analytical models well deserve to be "saved". We do not want to just press the "Enter" button. Of course, as Dr. Uijlenhoet rightly says, hypothesis testing for analytical models is a key issue. We are convinced that in our study the assumptions are justified, as the comparison presented in Figure 8 of the paper clearly shows.

I leave to the first author the opportunity to reply to the remaining specific questions. Once again, I wish to thank Dr. Uijlenhoet for the very accurate review which stimulates us to better clarify the above concepts in the revised paper.

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