

## ***Interactive comment on “Extreme runoff response to short-duration convective rainfall in South-West Germany” by V. Ruiz-Villanueva et al.***

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The manuscript by Ruiz-Villanueva and co-workers presents an in-depth analysis of a unique precipitation event in South-West Germany and the resulting flash flood. The manuscript is well-written, and deals with several aspects of relevance to the precipitation and runoff response, such as the hydrological and hydraulic modeling, and the impact of spatial variability in precipitation and storm motion on the hydrograph. Since the precipitation intensities during the event were (possibly) among the highest ever recorded, this manuscript has the potential to make a significant contribution to our understanding of such extremes and their modeling. Although — as Referee #2 has pointed out — the manuscript does not present any new methodologies (and does not

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claim to do so), it does make use of an interesting mix of existing methodologies to investigate different aspects of the discharge event, for instance for the radar estimates, the spatial rainfall analysis, and the post-event survey. I have only few comments, and recommend the editor to accept the manuscript with minor revisions.

### **1 General comments**

In the model, presented by Equations (3) and (4), it is assumed that channel flood and hillslope celerities  $v_c$  and  $v_h$  are constants. In reality, however, the hillslope celerity will depend on the local slope as well as on the thickness of the water layer. Both of these quantities will vary throughout the catchment, but moreover they will likely correlate with the flow distance to the catchment outlet. The impact of the assumption that  $v_h$  is a constant on the simulated discharge should at least be discussed.

While the model is calibrated on the discharge extreme, the performance of the model in simulating less extreme discharge events is not discussed. It would strengthen the claim made by the authors that the discharge peak was extreme (made in manuscript title) if they could show through modeling that in fact the runoff processes were significantly different due to the high rainfall intensities than during “normal” discharge peaks.

### **2 Specific comments**

Page 10747, Line 23: Change “right-hand” into “eastern”.

Page 10749, Line 23: “indicates indicate”

Page 10757, Line 22: Change “percentage” in “fraction”.

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