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Discussions

Interactive comment on "When does higher spatial resolution rainfall information improve streamflow simulation? An evaluation on 3620 flood events" *by* F. Lobligeois et al.

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This paper investigates the impact of rainfall data spatial resolution on flood hydro-graph simulation performances. The novelty of the paper is that the assessment of this impact is based on a huge number of flood events in a large set of French catch-ments. I would like to congratulate with the Authors for the clearness with which they present the science question, they explain the method and they discuss the results. I've really rarely encountered such an enjoyable paper to revise: while reading, every time a question was arising, the answer was to be found in the following section, as if the Authors could read in my mind. Consequently, I am definitely supportive of the

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publication of this paper in HESS. Actually the paper, in my opinion, could be published in the present form. I have a small suggestion only, actually an addition, which the Authors may decide to consider or not to consider. Since in the past I've worked at similar problems, I am curious to know if there is any effect of the movement of the storms on the simulation performances. Maybe a rainfall movement index could be added to I_sigma and I_L, such as, for example, the catchment scale storm velocity discussed in Zoccatelli et al. (2011, Eqs 6 and 16), which is already cited by the Authors. Also in Viglione et al. (2010) the movement term is discussed at page 221 and is quantified in Eqs. (13) and (14).

Minor comments:

Page 12497, line 19: maybe a rainfall movement index could be added here, such as, for example, the catchment scale storm velocity discussed in Zoccatelli et al. (2011).

Page 12499, line 22: "hydrological truths" seems a bit too strong to me :-)

Page 12499, line 28: "perfectly balanced" seems again too strong, unless "perfect balance" is somehow defined. If I were the Author, I would write "...KGE is balanced between..."

Page 12502, line 5: shouldn't "has now been further investigated" be "has been further investigated" or "is now further investigated"?

Page 12506, line 7: a curiosity here. For some catchments/events the spatial variable rainfall (even with a coarse resolution) provides a better input than the lumped one. I wonder if a lumped model could make use of indeces of spatial variability of the rainfall (just the indeces, i.e., I_sigma and/or I_L, not the spatial rainfall itself) to better reproduce the runoff hydrograph. Actually soft information could be retrieved for flood events on the region of the catchment more severely affected by rainfall, for example interviewing the people living there in post-event surveys. This soft information could maybe be converted into an index such as I_L and/or I_sigma and used in the model.

Any idea on how? PS. this discussion can be omitted from the paper, it is just my personal curiosity.

Figures 6 and 7: one panel could be added with a rainfall movement index such as, for example, the catchment scale storm velocity discussed in Zoccatelli et al. (2011).

Figure 6: maybe a log-normal plot would result in a more readable curve (which is quite skewed)

Figure 7: switch the last 2 panels for consistency with Fig. 6

Figure 7 and 8: just a suggestion, if in Fig. 7 a colour scheme is used for recognising different regions in France and the same colors are used in Fig. 8, the discussion of Fig. 8 would maybe become easier and clearer.

Figure 11: "The red points show the median values". The median of what? I guess of the relative KGE performance index.

Refs (already in the HESSD paper):

Viglione, A., Chirico, G. B., Komma, J., Woods, R., Borga, M., and Blöschl, G.: Quantifying space-time dynamics of flood event types, J. Hydrol., 394, 213–229, doi:10.1016/j.jhydrol.2010.05.041, 2010.

Zoccatelli, D., Borga, M., Viglione, A., Chirico, G. B., and Blöschl, G.: Spatial moments of catchment rainfall: rainfall spatial organisation, basin morphology, and flood response, Hydrol. Earth Syst. Sci., 15, 3767–3783, doi:10.5194/hess-15-3767-2011, 2011.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 12485, 2013.

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