Hydrology and Earth System Sciences Discussions

Interactive
Comment

Interactive comment on "Optimisation of LiDAR derived terrain models for river flow modelling" *by* G. Mandlburger et al.

G. Mandlburger et al.

First of all, we would like to thank both referees for their encouraging and constructive comments. We are glad, that both referees consider the paper to be clear and well structured. We also appreciate the critical comments, as they clearly point out where the manuscript can and should be improved.

Some detailed remarks concerning referee #2:

$>$ The only issue that I have is with the discussion of this method benefits.

Both referees made clear that stronger arguments are required to support the benefits of the proposed method. Cf. below for further details.

$>$ The author does however state that this method compares better with real flooding

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[..]. Supporting information [..] is presented, but a more thorough discussion [..] would make for a stronger line of argument.

Considering this comment, we discussed to perform a HN-simulation based on the discharge of the extreme 2002 flood event in order to be able to compare the results with reference data (e.g. digital orthophotos). After carefully discussing the pros and cons we decided against it. We have already pointed out our arguments for using the HQ100 discharge as the most important design discharge for hazard zone mapping in Austria. So we believe, that results based on the HQ100 discharge are more valuable compared to the extreme event. Instead, we will try to corroborate our method on the basis of flow vectors. We have used water levels and flow velocities (based on longitudinal and cross sections) in the discussion of our method so far, but we did not include the flow vectors. We can strengthen the statement concerning "compares better with real flooding" with a figure pair showing the flow directions around buildings and along relevant linear structures. First drafts of the intended figures (to be improved for the revised manuscript) are available at:

http://www.ipf.tuwien.ac.at/gm/hessd/flow-vectors-geom-a.pdf
http://www.ipf.tuwien.ac.at/gm/hessd/flow-vectors-geom-b.pdf

It can clearly be seen from these figures that the secondary currents around buildings (e.g. around the Dungl hotel) are well represented in geometry b whereas parallel flow vectors (even crossing the building!) can be observed in geometry a. Evidently, the flow vectors based on geometry a are less realistic compared to the LiDAR derived geometry b. A similar argumentation applies for relevant linear structures like the railway dam (not contained in the draft figures)

We believe, that this will give a stronger line of argument and hope, that it will meet consensus among the referees.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 5, 3605, 2008.

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