

## ***Interactive comment on “Evaluating scale and roughness effects in urban flood modelling using terrestrial LIDAR data” by H. Ozdemir et al.***

### **Anonymous Referee #2**

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The Authors present a study to show the effect that the geometrical resolution and roughness might have on the results of a model for flooding in urban areas. The study builds on previous work of the Authors and, although focusing on technical aspects of the model they developed, it might draw conclusions useful for other models designed for similar applications.

My main concern about the manuscript is related to the way the Authors justify their conclusions. They say that higher resolutions generates ‘small connecting “channels” that rapidly convey water across the domain’. However, these features and the differences between models in this regards are not shown in the figures. Figure 6 is not really readable at this level of detail and the other figures refer to some points but do not give information about the effect of various geometrical details. Further, the effect

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of the roughness coefficient seems to be marginal, as shown in Figure 12.

Another general, minor concern relates to the description of the model, which in my opinion relies too much on the previous publications of the Authors. Since I was not familiar with their work, I found it difficult to understand how the model works without reading some of the Authors’ previous papers, especially De Almeida et al. (2012).

I have listed more specific comments below.

- Introduction: I found this section very long and I think some parts could be shortened (for example, the part of page 5907, lines 5-24).
- P5906, L28-P5907, L4: this phrase is too long.
- P5908, L11-L15: this phrase is too long.
- P5911, L19: ‘(ranging...’.The parenthesis is opened here but not closed.
- P5911, L24: ‘...the Saint-Venant equations...’ are called ‘...the de Saint-Venant equations...’ in the abstract. Please, be consistent.
- Eqs 1 and 2: since the model is 2D, I would present the equations in 2D. Otherwise, it is quite difficult for readers not familiar with the previous work of the Authors to understand what is going on.
- Eq. 3: the symbol  $n$  had been also used to indicate the Manning coefficient. Although the difference is clear, it might be worth it to change the symbol of one of those.
- Eq. 3: how is the spatial weighting factor ( $\theta$ ) chosen? Does that play a role similar to the Manning factor? The Authors might comment on that, since it looks like some comparison with different  $\theta$  has been done in de Almeida et al. (2012).
- Eq. 6: the parameter  $\alpha$  in this equation looks more like the symbol to indicate proportionality.
- P5913, L15: ‘... $\alpha$  is a coefficient...’

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- P5914, L1-3: this was already said at P5911, L8-11.
- P5915, L23: the value of  $\alpha$  was already specified at P5913.
- P5915, L24: Eq. 5 should be Eq. 6.
- P5916: from Figure 6, it is not really possible to see many details that are discussed.
- P5917, L8-L19: the results that are shown do not make readers understand the role of these “channels”. Maybe, it might be worth it to show some cross-sections to identify differences due to the LIDAR resolution.
- P5917, L28: I did not really understand how the Authors concluded that the simulations are grid-independent. The example they used is a very simplified geometry; would the grid become more important if the test simulation didn't use a straight channel?
- P5918, L11-L12: in the previous page it is said that the results are grid independent, but here it is said that the grid resolution is important. I would try to check the words not to confuse between model grid resolution and LIDAR resolution (if I have well understood, this should be issue here).
- P5920, L11: it is not really clear how the  $F^2$  fit statistic is defined in this case. Also,  $F^2$  is called  $F2$  at P5916.
- P5922, L14: It was said before that  $\theta$  was fixed at 0.8.
- P5924, L9-L11: I don't think this conclusion is supported by the results presented (see general comments).
- P5924, L11: '...they generate frictional...'
- P5925, L4-L8: this phrase is too long.
- Fig 10: the name of the axes is a bit confusing (at a first sight, it looks like 1 m, 50 cm, and 10 cm are the name of the axes).

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