

Interactive comment on “Flood depth estimation by means of high-resolution SAR images and LiDAR data” by Fabio Cian et al.

Anonymous Referee #1

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The authors proposed a method to estimate the flood depth using SAR images and DEM data. The results were compared with the aerial photos, field-based measurement and the results of hydrodynamic modeling. The manuscript was well written. However, the verification is a little weak.

Line 58-59 There are many researches about mapping flood in urban areas, e. g. Nico et al., 2000, Chini et al., 2012. Please add more the state-of-the-art in this part.

Page 3 Many algorithms of detecting flood depth haven't mentioned in the introduction. However, the advantage of the proposed method comparing to the previous algorithms was not clarified

Section 2.1 In the previous study (Cian et al., 2018), two indices (NDFI and NDVFI)

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were proposed. Why the NDFI was adopted in this study.

Section 2.2 The estimation of water surface elevation was carried out in polygon based. What is the minimum size of the valid polygon? Is it time-consuming when the polygon number is large?

Line 256-260 The flooded dates of the three study areas were confused by the description. Please indicate the period of flood in each area.

Table 1 Five flooded SAR images were shown in this table. The image on Nov. 1 was counted as flood, however, there is no result shows the flood condition on Nov. 1th.

Figure 8 “Wan see by ...” Do you mean “We can see by...”?

Line 437-440 Why the flood depth decreased in Vicenza and increased in Saletto? Without the description of the whole flood condition, it is difficult to understand these differences.

Figure 11 Please add more description about this figure. When of the water depth shown in this figure? The color legend should be added.

Section 5.2 As mentioned in the manuscript, the hydrodynamic model needs more information than the proposed method, and its results were overestimated. It is difficult to verify the proposed method by comparing with the results from the hydrodynamic from Table 2 and 3. I suggest to add the quantities comparisons of area and depth in Section 5.1 using the aerial photos and the data of measure points, and remove this section.

Line 481 I think “Table 2 and” and “Table 3 confirm. . .” are the same paragraph.

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