

Interactive comment on “Improved estimation of flood parameters by combining space based SAR data with very high resolution digital elevation data” by H. Zwenzner and S. Voigt

Anonymous Referee #2

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The paper by Zwenzner and Voigt describes a method de delineate flood plains from SAR imagery, using additional information from high resolution DEMs.

My major concerns with respect to this paper, may be summerized as follows:

- The methodology to delineate the flood plane is **not clearly described**. It kind of gives an idea of how it works, but given this text, it would be very difficult to implement the technique correctly. The paper definitely needs to include a detailed description of the technique, such that readers could implement it. Some examples to illustrate:

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- It is stated that “the flood profile is shifted horizontally along the cross section by using a moving window over a defined range of sampling points”: is this a shift of the whole image (i.e. some kind of improved georeferencing), or is this only a part of the image, and if so, how is this done? How do you use this moving window? And what is this defined range of sampling points?

- The text states further, that for calculating the water level from the left and right border, “this is done for each individual cross section along the river flow line in order to establish a longitudinal profile of the flood level. A moving average is applied to the longitudinal water level to obtain a smooth water surface which serves as reference water level for the flood depth delineation. The horizontal extent of the cross section flood profiles is adjusted according to the reference water level and the flood plain topography.” So you somehow adjust the left and right border of the flood plane? How is this done exactly? Shouldn't you go through some kind of iteration in this step (because you started off with the levels at the right and left bank)? Where does the reference water level come from?

- The preprocessing of the data for both examples (Elbe and the River Severn) is different:

For the Elbe, you use:

- a 7x7 window for speckle filtering;
- a criterium based on a threshold for delineating the flood plane. It is found that the flood plane derived from the RADARSAT scene is too small: is this a result of an incorrect threshold? This threshold was chosen by trial and error: this was probably done by comparing the resulting flood plane for a given threshold with some reference image: which image (or map) was this? Definitely not the one obtained from the IKONOS image.

For the River Severn, you applied:

- a 31x31 window for speckle filtering;
- a multiresolution segmentation technique to delineate the flood plane.

I would suggest to use the **same technique for both examples**, such that the robustness of the technique can be demonstrated (now the results are not good for RADARSAT whereas the TerraSAR-X yields good results: this may partially be the result of different preprocessing steps).

Some minor comments:

- page 2954, line 14: combining (typo)
- page 2955, line 9: depend (instead of depends)
- page 2956, line 8: “It is supposed ...”: why?
- page 2958, line 4: are you sure it is radar shadow, or is it a low backscattering due to stretching of the backside of the mountain? Please check and correct if necessary at all places where radar shadow is mentioned.
- page 2959, lines 1-3: this contradicts the title of the paper which states “Improved estimation”: here you in fact say that the radar derived flood image is not good.
- page 2960, lines 17-19: explain better how this digitisation of the centerline was done.
- page 2961, lines 11-16: here you mention the construction of a TIN: this was not explained in the methodology and was not applied to the RADARSAT image. The same technique should be used on both examples.
- page 2963, line 23: typo: built-up areas
- figure 7: legend: change TSX to TerraSAR-X.

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