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Comment

***Interactive comment on* “Numerical simulation of levee breach by overtopping in a flume with 180 bend” by S.-T. Dou et al.**

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Nice analysis of the lateral erosion rates: below some comments and suggestions:

- The author uses the words break and breach. I would recommend the word breach for progressive failures of levees and breaks for instantaneous failures. Please update this in the entire paper. f.e. Breach flow, breach width, - The author uses the SWE's to model the breach growth. However for normal full scale breach formations the flow accelerates rapidly down the downstream face of the embankment. These rapid vertical accelerations are in conflict with the assumption of a hydrostatic pressure distribution which underlies the SWE's - Figure 10: gives the cross sectional failure of the breach. I believe that the change in cross sectional shape is governed by a geotechnical failure

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caused by a seepage flow and do not represent the reality correctly. Mentioning of the processes at hand in change in cross sectional breach shape would be beneficial. - Section 3.2 This part is quite unclear due to references to the right side of the break of the outer river. Maybe a picture with numbered locations would give a more clear description. - Rate of flow of the breach = breach flow rate. - Section 3.3 Please use the words: Breach invert level, or breach crest level to refer to the change in level of the cross sectional breach. The elevation in levee top is unclear. - The paper could do with a general update of the professional terms. - Page 3950 line 25: "The proposed calculation mode of break scour depth and lateral widening can effectively simulate the levee breach of sandy soil levee ". I disagree with this conclusion since the test setup and results solely allow for the conclusion that the code is able to model the lateral erosion rates with accuracy. The use of SWE's, the sudden reduction in test levee height during the start of the test are not representative for a full scale levee breach process. Hence I would recommend that the author limits his paper and conclusions to the lateral widening of the breach. - Since the paper already focuses mostly on the lateral widening, and considering the outcome of the experiments, and the fact that the change in the cross sectional breach shape is barely mentioned, I would recommend to rename the paper: Numerical modelling of the lateral widening of a levee breach..... etc

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