NHESSD

Interactive
comment

Interactive comment on "A comparison of a two-dimensional depth averaged flow model and a three-dimensional RANS model for predicting tsunami inundation and fluid forces" *by* Xinsheng Qin et al.

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Received and published: 19 July 2018

The authors would like to thank the reviewer for the time and the insightful comments that were provided. We have incorporated these comments into the revised manuscript and hope that we have addressed any concerns. Specific responses to review comments are shown below.

Specific comments

The authors gave sound explanations concerning the NLSWE and RANS models (ei-

ther directly or through the pertinent references): the mathematical basis, the options and simplifications of the configurations adopted, the settings and the boundary and initial conditions.

The results are, basically, presented by figures. It would be important to estimate some quantitative scores, in particular for the variables that are observed directly (water levels and velocities). These objective measures of the performance of each model will allow to understand their specifics. Particularly, it will be easier to separate what the authors called "near and post-impact" which, as it is right now, seems rather arbitrary.

This is a good point and we considered a variety of ways to compare the two approaches. In several iterations we presented quantitative representations of the results, but ultimately decided to remove them since many of the results (e.g discrepancies between numerical prediction and experimental measurements) lack quantitative consistency over time and between gauges. We feel that showing and discussing the results qualitatively with figures is more appropriate than giving quantitative conclusions because (1) the qualitative conclusions are quite consistent between gauges, and (2) we would expect quantitative differences to be site specific, while the qualitative results would be expected to be consistent from site to site.

Technical corrections

Through the whole text - a comma before "and".

We have re-checked the manuscript and added comma before "and" where it was grammatically appropriate.

Pag 2 and 4 - The fourth paragraph of page 2 (the one starting with "The scale...") is repeated ipsis verbis in page 4 (second paragraph).

This has been addressed in the manuscript.

Pag 5 - Manning's coefficients are not friction factors (nondimensional numbers). They have dimensions. The value of the Manning coeficient should reflect the type of mate-

rial of the bottom used in the Laboratory (the simulations were at the model scale) and not justified with a reference.

The unit for Manning's coefficient has been added. 0.025 is a very typical value used in tsunami simulation to represent earth ground. In our study, 0.025 is shown to give good agreement in arrival time of tsunami waves.

Pag 16 - In the second paragraph the two steps methodology should be clarified. What end of the domain are refering ?

This has been clarified in the manuscript.

Pag 18 - In the sentence after equation (23) it should be I not u' for the definition of turbulence intensity.

We believe we are referring to I for the definition of turbulence intensity there.

Pag 20 - There is an inconsistency. There is text between 4.3 and 4.3.1 (contrary to between 4.2 and 4.2.1).

The text (discussion) between 4.3 and 4.3.1 are motivated by the necessity of introducing flow parameters and gauges in the experiment. There is no text between 4.2 and 4.2.1 because we feel that there is not much common between the setup of two models and we separate the discussion of the setup for two model immediately at the beginning of section 4.2. We feel that it is acceptable to either have or have no text between a section title and the subsections within that section.

Pag 30 – The first conclusion should be rephrased. The words "only" and "while" are misleading in this context.

This has been modified in the manuscript.

Pag 30 - In the third conclusion what it is the meaning of "correct value" ? It is a model-to-model comparison.

The word "correct value" has been replaced with a more appropriate phrase.

Please also note the supplement to this comment:
https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2018-150/nhess-2018-150-AC3-supplement.pdf

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., https://doi.org/10.5194/nhess-2018-150, 2018.