Natural Hazards
and Earth System
Sciences

Discussions

Interactive comment on "A Dynamic Bidirectional Coupled Hydrologic-Hydrodynamic Model for Flood Prediction" *by* Chunbo Jiang et al.

Anonymous Referee #1

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The manuscript is interesting coupling between two different models to improve flood simulation.

My first comment is directed to the title. Flood prediction is stated as the main aim. This should be rephrased to flood simulation to avoid confusion. Prediction is often associated with forecast, which is not the aim of this manuscript.

My second comment is related with the branding of "2D diffusion wave" with "hydrological model". It seems that the authors have developed a 2D diffusive wave model (line 139). If that is the case, this cannot be categorised as hydrological model. The title should be rephrased to "coupled diffusive-full dynamic". Unless the authors can justify the branding of hydrological model, this must be changed.

Some properties of Hydrological models are: a) only propagate information downstream; b) are inherently one-dimensional when simulating flood routing (channels or links), and c) able to simulate other discharge components such as interflow and baseflow besides direct discharge.

Hence it seems that this not fits to the description of the authors. This requires some rethinking and restructuring of the manuscript, but is required in order to avoid misinterpretation of the good work developed.

My third comment is related to the time steps. how are the time steps being calculated, and how are the two model synchronized?

My forth comment is related with the display of the results. The manuscript is about coupling two different models; however, it is not clear in the plots where the boundary is. Please add to all plots the location of the boundary between the two.

minor comments: line 60, "evolved" instead of "involved"

line 60, "overestimate the flood risk in some extent" is too vague, please rephrase

line 70 to 73, is confusing. e.g. the same sentence starts with "the next step", and ends with "the next time step", is the former not time? What is the meaning of "present flow state"? is that same as current, as stated previously? if yes, always use same wording for the same meaning.

line 80, why is it a "significant problem" please explain.

line 85, remove "of"

line 86, should read "considers"

line 91, "apt to", replace with "adequate". to perform what? (not clear). "doesn't" replace with "does not"

line 82 should read "further studies are necessary"

line 109, what is "slope runoff" - consider removing the word "slope" and use simply runoff throughout the text

line 173, is telemac being used, or it was "re-written". please clarify this.

line 193, is the hydrological model 1D or 2D, if it is the latter, it can also produce inundation extents. please add some plots which show the boundary of the "hydrological" and hydraulic model being changed. Overlay these with the flood inundation extent.

line 212, "is moved to point A", so where was it before?

lines 215 to end of paragraph is confusing.

Figures 2 and 4, what is the colour code?

Figure 4, why water cannot flow to the left in the middle figure?

Figure 7, why are there spikes on the depth?

Figure 8, is this already with the DBCM? if yes, where is the boundary of the two models in those plots.

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