

Interactive comment on “Modelling the high-resolution dynamic exposure to flood in city-region” by Xuehong Zhu et al.

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Comments on Manuscript “Modelling the high-resolution dynamic exposure to flood in city-region”

Urban flooding is an interesting topic due to more frequent and serious flooding in the large cities caused by climate change and urban development. This study proposed an approach to model dynamic exposure to flood in Lishui, a city in Zhejiang Province, China. Although the flood model is well-known, its combination with an agent model is interesting and useful for modeling dynamic exposure. This paper can be accepted for publication in HESS if the following comments can be properly handled.

1) In the title, the authors mention “high-resolution”. But I didn’t see any high resolution

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descriptions in the manuscript. Do you mean spatial resolution or time resolution? 2) The authors used the well-known LISFLOOD-FP as the flood model. However, many details are missing about this model. For example, what are the spatial and temporal resolutions of this model? How was this flood model calibrated and validated? 3) I don't understand why the authors used synthetic rainfall data for the 2014 flood. If the authors used synthetic rainfall data, how can the flood model be validated? This kind of synthetic rainfall generation method is often used for urban planning. I propose the use of actual rainfall data. There are too many assumptions behind this synthetic rainfall generation method. For example, is Chicago hyetograph valid in this region? Is the rainfall from 6am-12 pm reasonable? 4) Actual flow and water level data in 2014 were used. Then why synthetic rainfall data? 5) Line 151: what is "r" here? I didn't find this variable in the equations. Please explain. 6) Line 162-163: please provide references to these methods. 7) Line 165-167: please provide evidence to this sentence "ABM is considered most suitable to address challenges associated with simulating the complexity and dynamic variability of population exposure to flooding due to its capacity to capture interactions and dynamic responses in a spatial environment". 8) Line 222-223: please specify the GIS tools or software the authors used in this study. 9) I didn't see many details of the agent model the authors used. Is this only a meta model or kind of simulation model? I expect more details about this model. 10) There are many assumptions and simplification when the authors assess the dynamic exposure. Therefore it is also very difficult to verify the model the authors set up. 11) Many details of the agent model are referred to the experiences of other countries. Can the authors add discussion about this? Are these experience applicable in China? 12) Again, I didn't understand why the authors use the traffic data of 2017 for validation of the agent model instead of those of 2014? 13) How was the flood model validated?

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