Hydrology and
Earth System
Sciences
Discussions

# *Interactive comment on* "Targets-specified grids-tailored sub-model approach for fast large-scale high-resolution 2D urban flood modelling" *by* Guohan Zhao et al.

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The topic of the presented study is interesting and relevant: fast flood models to allow for real-time urban flood forecasting. However, the presented manuscript has a few aspects that would benefit if improved and clarified: (1) There are other types of flood models in addition to the "2D hydrodynamic" and "1D static" models. What about "1D dynamic" models? (2) What is the novelty of Module 1 when compared to previously proposed methods (e.g. Maksimovic et al., 2009)? (3) Apparently, nothing is novel in Module II. As far I can understand, it uses ArcGIS and Arc-Malstrom methods to generate a 1D surface channel network. (4) In Module III, as the authors mention in lines 271-277, the proposed "new" method sounds as a new implementation a method previously developed (in Arc-Malstrom). (5) The proposed methodology could have

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been tested in (a) different catchment(s) with (b) different type of rainfall events. This would test if the proposed methodology is valid for different contexts. (6) The proposed method is based on various parameters that need to be pre-defined (e.g. HRVratio = 15% and VLratio = 5%). It would be important to learn about what impact the values of these parameters may have in the final results (and if they should be different from catchment to catchment...). A sensitivity analysis would be required.

Other comments: - It is unclear what "Optimised boundary" is. Description in Section 2.5 and Figure 7b are not sufficient. This definiotion is very important to understand the flood model results. - It is not surprising that the "Municipal domain" approach shows poorer results than the other two cases - water does not "follow" administrative boundaries... - Quality of plots (and tables as figures) should be improved. - Results of flood velocity are not explored. For example, in the table of Figure 14 the velocity results could be presented to evaluate the accuracy of this important flood characteristic. - In abstract (line 30), the RMSE value seems to relate to flood depth. How does flood extent and flood velocity compare?

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