November 25, 2014

Dear Prof. Qiu,

Thank you for all your helpful comments. We summarize our major changes as following.

First of all, we revised all the wordings or sentences based on your suggestions. Secondly, we carefully addressed each comment and reply them in detail in the attached file.

Sincerely yours,

Lin Liu and Yong Liu

The manuscript proposed a CA based model simulating storm water runoff in urban settings. The paper was well organized and well written. The model proposed was both effective and efficient, and was validated by real storm events. I recommend the paper to be accepted with minor revision, as suggested below:

1. The author reviewed many other hydrological models and listed their drawbacks. Some of these models are CA. It was clear if the proposed model is better than other CA models, although there is comparison with physical process based model.

Re: Yes, we did compare our CA model to a physical process-based model. That comparison demonstrates the simulation reliability of CA model. In fact, we have downloaded the 5.9.6 version (Bates et al., 2013) of LISFLOOD-FP model, and tried to compare it with our CA model as well, however, the parameters it requires to set up the model such as the boundary conditions, channel geometry etc. are difficult to obtain in the downtown area, and we failed to make a direct simulation comparison between our CA model and that LISFLOOD-FP CA model. On the other hand, our CA model aims to city emergency management, which requires the model is easy-established and efficient in computation. Our CA model demonstrates its performance in simulation reliability and computation efficiency.

2. The in-situ data calibration and validation is a unique part of the research. It was not clear how widely this technique is used in other studies.

Re: Thanks. The accurate monitoring process data of water depth on the street in a storm event is rare. Fortunately, we got the street monitoring CCTV records from local government, which are available for the outlet location of the catchment for both events. Time series of water depth can be estimated reasonably well based on the traffic separation metal fences visible in the videos. Depth was estimated with reference to the relative height of the water reached on the metal bar. This is assisted by the use of other referencing objects such as curbs and car wheels. Peak depths were obtained immediately after the events based on the watermarks left on the metal fences. It should be noted that there can be uncertainties in deriving water depth from images, a relative common problem in feature extractions from videos. Nonetheless, the general patterns of flood depth can be discerned from the CCTV images of the site.

3. In part 5(summary and discussion), the authors stated “This CA model is established primarily by using building corrected DEM data”.

Re: We derived the building corrected DEM from increasing 10 m to the grids with building footprints. As mentioned in text, this CA model is established primary based on building corrected DEM, and also with land use data.

4. In the introduction part, paragraph 3, page 6176, line 14, the sentence is “Therefore, the requirements of these methods dot not fully meet the demand of city emergency management (Zhang and Pan, 2014)”. I believe it should be “do not”.

Re: Corrected to “do not”.

5. In the introduction part, paragraph 5, page 6177, line 10, the word “LOSFLOOD-FP” should be LISFLOOP-FP.

Re: Corrected to “LISFLOOD-FP”.