

## ***Interactive comment on “An advanced distributed automated extraction of drainage network model on high-resolution DEM” by Y. Mao et al.***

**Y. Mao et al.**

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Dear referee #2,

Thank you very much for your excellent comments concerning our manuscript entitled "An advanced distributed automated extraction of drainage network model on high-resolution DEM". All your comments are of much importance and provide us better guidance on paper writing and research work.

We have studied your comments carefully. We would like to try our best to explain the significant role of our modeling strategy in the area of water resources and to revise inadequate address, and lastly we sincerely hope that our responses could reach your satisfaction.

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1. "The paper is structured such as a technical note since it considers only the comparison with HydroSHEDS and SRTM data. Is this enough to propose a paper in the HESS journal? Probably not, since a more technical and topic-specific journal should be suitable." Response: we tried to introduce our new method using the simplest way. Maybe, our work is not enough to make reviewer satisfied. We think we can try our best to improve the paper. The advanced distributed automated extraction of drainage network model (Adam) is different with other methods, which search upward from outlet of basin instead of sink filling base on subbasins. Adam is not only to get continuous drainage network, but also is more efficient than other methods. So this paper is not just a technical work, it also contain scientific research.

2. "High-resolution topography: at my eyes and according to literature this term is more common for lidar (or also other) data that are able to generate a DTM with a grid cell size less than 3 m."

Response: The 'high-resolution DEM' used in this paper is proposed when compared with other low-resolution DEM data such as the 30s DEM adopted by HydroSHEDS product. 'High-resolution' may be not suitable used in this paper, and we will corrected as you advised. However, the main aim of this paper is to propose a new method, the 3s DEM is just an example. We can used the method in 3m DEM too.

3. "Computational time: any discussion, table or number is unsuitable without describing the hardware specifics. What about processor, and ram used? Is the presented methodology parallelized? I strongly recommend to consider the recent and very interesting paper by Richardson et al. (2014) about a parallelizable method for calculating drainage area."

Response: Here, we assume that under the same hardware condition, computational time of ArcView and Adam method are obtained. We should address more specifically and detailly about the hardware condition as you advised. In our method, we divide sub-basins on low-resolution DEM, and then extract drainage network on sub-basins

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of high-resolution DEM. So we can easily implement parallel algorithms on sub-basins. As for the methodology, we also make it parallelized. We should describe it in paper.

4.“Why considering only D8? In literature several other methodologies are available (e.g. D8-LTD).”

Response: As you mentioned, there are several other methodologies (e.g.D 8-LTD) available. Here, we mainly consider D8 for the reason of that D8 method is one of the most efficient and widely-use method to obtain flow direction. We will consider other methodologies in the later studies.

Attached please find the revised version, which we would like to submit for your kind consideration.

We would like to express our great appreciation to you for comments on our paper. Looking forward to hearing from you. Thank you and best regards. Yours sincerely, Aizhong Ye

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