

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

**Anonymous Referee #2**

Received and published: 5 August 2014

This paper presents an advanced distributed automated model for extraction of drainage network using high-resolution DEM. According to the authors a high-resolution and high-accuracy drainage network map is a prerequisite for simulating the water cycle in land surface hydrological models. Since conventional GIS method often are not able to manage high-resolution DEM of large basins, an advanced distributed automated extraction of drainage network model was proposed in the study. The model is structured in two sections: (1) searching upward from outlet of basin instead of sink filling; (2) dividing sub-basins on low-resolution DEM, and then extracting drainage network on sub-basins of high-resolution DEM. The authors used elevation data from the Shuttle Radar Topography Mission (SRTM) at 3 arc-second resolution in Zhujiang River basin, China. The results show Adam model can dramatically reduce

C2921

the computation time. The results suggested that the extracting drainage network was continuous and more accurate than HydroSHEDS (Hydrological data and maps based on Shuttle Elevation Derivatives at multiple Scales).

I read with interest the paper, however at the end it leaved me rather puzzled. I summarize here the main critical issues:

(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.

(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.

(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.

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

Unfortunately the paper, based on these considerations, is not ready for a publication in HESS. I also recommend a more specific and methodology based journal, but only after improving the paper along the four raised points.

Richardson, A., C. N. Hill, and J. T. Perron (2014), IDA: An implicit, parallelizable method for calculating drainage area, *Water Resour. Res.*, 50, 4110–4130, doi:10.1002/2013WR014326.

C2922

C2923