Hydrology and Earth System Sciences Discussions

Interactive comment on "An effective depression filling algorithm for DEM-based 2-dimensional surface flow modelling" *by* D. Zhu et al.

Anonymous Referee #1

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Review of the paper hessd-9-10011, "An effective depression filling algorithm for DEM-based 2-dimensional surface flow modelling," by D. Zhu, Q. Ren, Y. Xuan, Y. Chen, and I. Cluckie

OVERALL COMMENT

The authors point out that there is an important problem when overland flow is represented in grid-based distributed models by combining 2-D surface flow models and conventional sink removal algorithms. As far as this reviewer knows, this issue is still unpublished. Hence, the paper under review is worthy of publication in Hydrology and Earth System Sciences. Following there are comments and suggestions that I hope will help the authors to improve their paper.

SPECIFIC COMMENTS

Page 10012, line 6. Replace "rink" with "sink." The authors may want to read the manuscript carefully in order to correct typos like that reported here.

Page 10012, line 22. There are cited papers (e.g. Moretti and Orlandini, 2008) that are not reported in the references section. Please check all the citations throughout the manuscript.

Page 10013, line 22. Replace "Olivrea" with "Olivera." The authors may want to read the manuscript carefully in order to correct typos like that reported here.

Page 10018, line 3. K is the Gauckler-Strickler conductance coefficient (it increases as resistance to flow decreases), M is the Manning resistance coefficient (it increases as resistance to flow increases), and the underlying equation is the Gauckler-Manning-Strickler (GMS) equation (first proposed by Gauckler, but often referred to as Manning equation). The authors may refer to Hager (2001).

Page 10039, Figure 5. Figure 5a would be made much more informative by reporting flow directions as made in Figure 2.

REFERENCES

Hager, W. H. (2001), Gauckler and the GMS formula, Journal of Hydraulic Engineering, ASCE 127: 635–638. Moretti, G., and S. Orlandini (2008), Automatic delineation of drainage basins from contour elevation data using skeleton construction techniques, Water Resour. Res., 44, W05403, doi: 10.1029/2007WR006309. Orlandini, S., and R. Rosso (1998), Parameterization of stream channel geometry in the distributed modeling of catchment dynamics, Water Resour. Res., 34(8), 1971–1985.

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