

Geosci. Model Dev. Discuss., referee comment RC3  
<https://doi.org/10.5194/gmd-2022-92-RC3>, 2022  
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## Reply on CC1

Anonymous Referee #1

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Referee comment on "An Improved Algorithm for Simulating Surface Flow Dynamics based on the Flow-Path Network Model" by Qianjiao Wu et al., Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2022-92-RC3>, 2022

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Dear Authors,

Thank you for your detailed reply. Although I cannot find the revised version for the moment, I think you have addressed most of the concerns I raised. However, I am still worry about the normalization method used for Eq. (6) in your manuscript, so I add this comment.

According to your reply, the min-max normalization method was adopted. For a target cell, the points with the maximum or the minimum value of the parameters in the basin may not be located at the upstream area of this cell. So the flow velocity of a cell by Eq. (6) may be affected by the cells which do not drain flow to it. This is very odd because they are unrelated.

In addition, I attached a PDF document to show that a cell can be assigned with different normalized parameter value when basins with different scales (such as a large basin and its subbasin) are used for simulation, so its flow velocity by Eq. (6) can vary. This phenomenon shows that the results of the new algorithm are unstable, and the good performance for the Black Brook Watershed may be a lucky result caused by the weights decided by the subjective analytic hierarchy process (AHP). But these subjective weights may not be suitable for other basins.

Please also note the supplement to this comment:

<https://gmd.copernicus.org/preprints/gmd-2022-92/gmd-2022-92-RC3-supplement.pdf>