Nonlinear Processes
in Geophysics

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Discussions

Interactive comment on "Explanation of the values of Hack's drainage basin, river length scaling exponent" *by* A. G. Hunt

A. G. Hunt

allen.hunt@wright.edu

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The principle issues raised by the referee indicate that the main message of the manuscript was not successfully communicated, namely that it is not any particular physical property of the medium which is at, below, or above the percolation threshold, that is relevant to the establishment of a stream path. For the heterogeneous medium, a path at the percolation threshold can always be found that minimizes the total flow resistance by choice of a suitable integral over the local flow resistance distribution. This flow resistance distribution connects neighboring points on the surface. The scale can be made almost arbitrarily small (the referee has assumed equal to a particle size), in which case any finite medium approaches the thermodynamic limit. But this scale was not the scale envisioned, rather a smallest length scale was imagined as

being related to a channel width. For a homogeneous medium, the bonds that connect a path at the percolation threshold could be generated by exceedance of a particular precipitation threshold.

Please also note the supplement to this comment:
http://www.nonlin-processes-geophys-discuss.net/2/C439/2015/npgd-2-C439-2015-supplement.pdf

Interactive comment on Nonlin. Processes Geophys. Discuss., 2, 1355, 2015.

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Interactive Discussion

Discussion Paper