

Interactive comment on “Opinion paper: Linking Darcy’s equation to the linear reservoir” by Hubert H. G. Savenije

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This Opinion manuscript describes an attempt to link Darcy’s law that describes water flow at a small scale to the linear reservoir at the scale of a whole catchment. The main idea described here is that it is through the assumption of a constant resistance term along the flow that results in the linear reservoir, motivated by the minimum energy expenditure conjecture in works on river networks.

The manuscript is nicely and clearly written, and I found it stimulating to read. I do not really have much to say about this manuscript and recommend publication after a minor revision. I think it will be a very nice Opinion that will stimulate further research.

I think one aspect that would be nice to be added in a revision would be to describe

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a bit more extensively at the end on how the critical assumption that the resistance to drainage is constant could be tested by using observations and/or models. Also, I think it would also nice if the author could add some thoughts on what the evolutionary dynamics may be that would lead to a constant resistance to drainage. These two points would help to encourage the reader how the opinion described here could be tested and extended in future work.

Minor comments:

line 36: “found” not “find” line 61: I think the correct term used by Rinaldo and Rodriguez-Iturbe is “minimum energy expenditure”, not “minimum energy production”. line 92: I think you intended to refer to Kleidon et al. (2013), not Kleidon and Renner (2013) line 124: A data source for the runoff series would be nice. line 131: “(is dynamic)” - do you mean “(that is, dynamic)”? line 134: I think a “tau” would be nicer than a “K”, as the letter K is typically associated with a conductivity, and tau with a time scale. As you talk about a time scale, “tau” would be more appropriate. line 201: I do not know what “freatic” is - briefly explain?

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