

Interactive comment on “Yardangs and Dunes: Minimum- and Maximum-Dissipation Aeolian Landforms” by Ralph D. Lorenz

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I am grateful for Dr. Ozawa’s comments, and will attend to the various minor points raised.

On the matter of figure 6 and the overall framework, I indeed recognized that yardangs are ephemeral in that since material can only be removed, once yardangs adopt the traditional shape, they only shrink and disappear. Thus the right-hand side of the supply/removal balance is not a true equilibrium, but only a quasi-steady state that asymptotes to oblivion.

The left-hand side, with ‘supply-only’ accretion of material in the ‘fingering’ mode, is similarly not stationary, as the sand inventory continues to increase.

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Only the intermediate scenario, with supply and removal in balance, is a dynamic equilibrium that can remain constant in time.

So I wonder then if this paradigm can offer some guidance on the behavior of fluid systems such as ocean circulation, atmospheric dynamics etc. with non-steady forcing. E.g. when heating is suddenly applied to a fluid system (and its ability to reject that heat has not yet developed) does it grow in a minimum-dissipation configuration until a maximum-dissipation steady state is reached? The discussion paper esd-2019-52 by Kleidon et al is relevant in this respect.

Interactive comment on Earth Syst. Dynam. Discuss., <https://doi.org/10.5194/esd-2019-73>, 2019.

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