

## ***Interactive comment on “Constraining the Stream Power Law: a novel approach combining a Landscape Evolution Model and an inversion method” by T. Croissant and J. Braun***

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In this paper, Croissant and Braun address the important and well-known problem of constraining the  $K$ ,  $n$  and  $m$  parameters of the popular stream power law, in its detachment-limited version. They propose to use a procedure based on finding the minimum misfit for  $K$ ,  $m$  and  $n$  that provide the least landscape change of a synthetic or natural landscape submitted to erosion over one time step and under a given/arbitrary uplift field. To do so they use the Neighborhood Algorithm inversion method and the FastScape landscape evolution model.

Within the limits of the - clearly stated - assumptions behind this work (steady state

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and stream power law), this is an important contribution that will be of use to those trying to invert information from topography. There is one comment and two reviews for this manuscript. Both reviewers Gareth Roberts and Alan Howard agree that this is a useful study, and they both highlight the overall scientific quality of the paper.

I concur with them and note that the paper should therefore be accepted with minor revisions.

Apart from minor comments and edits, the main requests (that have already been addressed by the authors online) are to: 1) Add figures that show comparisons between observed and theoretical river profiles 2) Discuss how the inversion procedure works when  $n \neq 1$  3) Modify their use of Roberts and White (2010) and Roberts et al. (2012) 4) Modify figure 5

Looking forward to receive the revised manuscript, I thank the authors Croissant and Braun, reviewers Roberts and Howard, and commenter Champagnac for their contribution to ESurf.

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