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Earth Surface Dynamics Discussions

Interactive comment on "A segmentation approach for the reproducible extraction and quantification of knickpoints from river long profiles" *by* Boris Gailleton et al.

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The authors present a technique for finding and quantifying knickpoints in river profiles. The group of coauthors belongs to the forefront researches in the field of developing morphometric tools having already developed a large software suite.

The manuscript is quite well written and reviews previous approaches properly. But despite this overall positive impression I am not convinced that this undoubtedly nice piece of work should be a full research paper in Earth Surface Dynamics.

First, I am not completely convinced that the automatic detection of distinct knickpoints

is still such a great step in fluvial geomorphology. Knickpoints are fundamental for understanding the effect of sudden temporal changes or discontinuities in lithology, and they were a primary measure in morphometry at times where high-resolution DEMs were not widely available. However, one may question whether finding such distinct points automatically has really a greater potential than analyzing river profiles or even entire drainage networks as a whole. This might reduce the importance of this work a, but does of course not question the merit of this work.

But as my most severe doubt, I see the new aspects presented here as a piece of a mosaic. If I understood the concept correctly, the new part is applying the TVD method from signal processing to the k_{sn} values described in Sect. 2.3.1., while the earlier steps of the analysis are apparently based on previous work. And this key point is not explained very well. I would have expected more explanation why this is a particularly good concept in the context of river profiles going beyond the comparison of the entire procedure with other approaches.

Taking into account that entire packages such as TopoToolbox are published as a short communication in Earth Surface Dynamics, the recent manuscript would not be well-placed as a full research paper in my opinion. In order not to be misunderstood – this is a nice piece of work, but if we are honest, each comprehensive package such as LSDTopoTools from your group contains many important and innovative components, and it would not be realistic to derive a full research paper from each of them.

My recommendation would be either focusing the manuscript on the essential new part and submit it as a (very) short communication or including the methodical aspects into a later paper where scientific results are derived using the method going beyond the test cases presented here.

No matter in which direction a revised version goes, there are a few minor points that deserve some more attention. I am, e.g., not sure whether the definition of χ was indeed introduced in the conference contribution by Royden et al. (2000) more than

10 years before it became popular; at least I did not find it in the cited abstract. As a second example, the lower sections of page 5 read as if 2014 was more recent than 2017. However, these minor points can easily be fixed.

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