Earth Surf. Dynam. Discuss.,
https://doi.org/10.5194/esurf-2020-85-RC1, 2021

Earth Surface Dynamics Discussions
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Interactive comment on "Planform river channel perturbations resulting from active landsliding in the High Himalaya of Bhutan" *by* Larissa de Palézieux et al.

Anonymous Referee #1

Received and published: 2 January 2021

Comment to Authors Title: Planform river channel pertubations resulting from active landsliding in the High Himalaya of Bhutan Journal: Earth Surface Dynamics Corresponding author: Larissa de Palézieux Co-authors: Kerry Leith, Simon Loew

General remarks The manuscript presented by Palézieux et al. deals with the quantification of lateral channel migration induced by large creeping landslides. They used Fourier transform to separate natural channel amplitudes from landslides-produced variations. Using the inventory of Dini et al. (2020), they show that a large majority of creeping landslides cause lateral channel migration. Furthermore, they hypothesize that creeping landslides are primarily triggered by migrating knickpoints. Under

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this assumptions they back-calculate the timing of the onset of creeping landslides showing that a phase of activity alternated with a phase of slower movement/inactivity. Lateral channel migration produced by creeping landslides is not very well quantified and the usage of Fourier transform a somewhat unique approach. Combined with the approach to constraint rates of activity the manuscript shows enough originality to be published. However, the authors should modify, clarify and/or reassess a couple of points. The manuscript contains a few assumptions which have to be discussed more in detail. The authors mention that seismic activity in the study area is low. This observation is explained in the introduction. Hence, seismic activity is not responsible for triggering creeping landslides. So the authors assume now that knickpoint migration is mainly responsible for triggering creeping landslides. But what about hydrological and climatic influences? What about lithological weak point? Furthermore, migrating knickpoints are primary produced by seismic activity. How do the authors explain the knickpoints in the first place? Especially influences of climate as well as lithology have to be discussed more in detail. Another point are the methods, which seems to contain a few flaws. Especially when calculating the planform channel offset DL. The calculated channel axis, probably derived from the DEM, is crossing the hillslope (Figure 6). Resulting in negative values in the distance distribution of the landslides. Especially the distance distributions (Figure 6 bottom) pose some questions. Please, check the comments in added in the supplement file. Especially the discussion needs further improvement since a lot of the written paragraphs belong to the Methods or Results. Rarely any of the Results are put into perspective with previous research. Regarding the general structure: The introduction is too long (10 pages). Therefore, I would recommend to revise how necessary certain explanations of methods are (e.g. lateral channel migration is explained in the Introduction as well as in the Methods) and if there is the possibility to add another section “Regional setting”. Regarding the sentence structure and usage of scientific terminology: Even though methods are explained in quite the detail, often terminology is used without proper definition and in varying contexts. Examples are mentioned in the technical details. Furthermore,

sentence structures are often too long and too complicated which results in grammar mistakes, sometimes leading to sentences which are hard to understand.

Please also note the supplement to this comment:
https://esurf.copernicus.org/preprints/esurf-2020-85/esurf-2020-85-RC1-supplement.pdf

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