Natural Hazards and Earth System Sciences Discussions

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC1
https://doi.org/10.5194/nhess-2021-212-RC1, 2021
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Comment on nhess-2021-212

Ugur Öztürk (Referee)

Referee comment on "Evaluation of filtering methods for use on high-frequency measurements of landslide displacements" by Sohrab Sharifi et al., Nat. Hazards Earth Syst. Sci. Discuss., https://doi.org/10.5194/nhess-2021-212-RC1, 2021

Overview and general comments:

The authors try to test three filtering methods to reduce scatter in landslide monitoring data. They check in several testing frameworks using synthetic time series whether filtering would lead to losing an early warning pulse. They also demonstrate their method with a real-world case. The article is well written and fluent. The study's motivation and implementation are of interest to the landslide research community, and they are adequate for NHESS. Before being published, I recommend some minor revisions to increase the potential impact of the research.

My main concern is the lack of a distinct "Discussion" section. Authors discuss their results within the section "Results and Discussion". Although they provide an overall discussion of the entire work at the end of this section, they lack linking the findings to the existing literature. Hence, I would recommend separating the "discussions" from the "results". My further minor recommendations are listed below.

Minor comments

I recommend using more active sentences if possible; for example, the last sentence of the abstract could as well be written as an active sentence.

Introduction

The introduction is well written. Authors could consider extending their literature review

by including some other examples. A few citations seem to appear oddly frequent. I also find series of citations after a particular statement relatively inefficient; authors should consider elaborating why they cite a specific paper (this comment applies to other sections as well).

Another aspect that could increase the fluency of the text is to use prefixes, for example, using "infeasible" instead of "not feasible". Would you please check other possible places where this point could be improved?

Lines 52–60 sound like a method, and I recommend rewriting this section a little more towards a "problem statement".

Methodology

There are a series of abbreviations used in the article, some of which make sense not to repeat each sentence. However, some of them decrease the fluency of the text, e.g., NASD or BR.

Line 105: "cumulative negative displacements", shouldn't it be between "0" and "-1" instead of "1" to "0", while "0" indicates the point of origin.

Line 106: "absolute cumulative displacements" should be from "0" to "1", not from "1" to "0", isn't it?

Line 134: Do the authors mean residuals when stating "ratio of scattering amplitude".

Lines 156–162: mentioning the GWMA acronym once might help the reader link the abbreviation to the subsection.

Line 169: Here, does the word "above" relate to GWMA"?

Line 170: Authors mentioned "evenly spaced" data. Does the method also work with missing data or unevenly spaced data? Later on, in line 262, a similar issue is mentioned: when a data point is classified as an outlier, it is replaced with a new interpolated data point, which is not a proven practice. It could be an option to leave it as a NaN, or some bootstrapping and randomization process needs to be implemented.

Lines 181–186: I found this part of the text somewhat confusing; please consider reformulating the text.

Line 241: even if it is commonly used, please state the open form of GNSS.

Results and Discussion

Would it be possible to introduce sub-sections to distinguish the effects of direct and indirect filtering on the synthetic analyses?

Line 373: "even", is it "event"?

Line 436: Could authors perform RMSE or another approach to quantify the trends in the data instead of visual inspection.

Line 464: Could an example of the outlier removing process be supported with a figure to visually demonstrate which type of data point authors considered an outlier.

Tables

Table 1: Could table 1 be integrated into Figure 1 to save space and better relate to one another?

Table 2: "60-s reading" could be mentioned as "1-m reading" to have synchrony with "1-h reading".

Table 4: Could this table be transformed into a figure?

Figures

Figure 4: A legend would help the reader to follow the figure as a stand-alone item. Currently, Geocubes are not explained in the figure. Resolution is also low to see the individual features correctly. Also, in subplot (a), the location of the study site is not highlighted in the map of British Columbia.

Figure 6: Would it be possible to combine subplots to compare them better. Y-ticks are tough to relate to at the moment.

Figure 9: Instead of a linear y-axis, an option could be y^2 (e.g., 2 4 8 16) or y^3 (e.g., 2 8 32 128) style access to distinguish the lines from one another for better visibility. Similarly, please consider this approach also for figure 17.

Figure 11: This could be shown earlier in the manuscript to understand the framework better. Similarly, figure 13 could also be placed earlier.

Figure 15: it resembles scenario 2 of the synthetic analyses. Consider linking them in the figure and in the main body. It might help the reader to relate synthetic analyses to the real-life case.

Figure 16: I found the figure and the related text in the main body somewhat confusing.

Figure 17: it is hard to distinguish the lines from one another.