NOTE: Reviewer's comments are in *italic* and our responses are in red letters.

The paper "Evaluation of filtering methods for use on high frequency measurements of landslide displacements" deals with the effects of different filtering techniques to be applied to landslide displacement data in the framework of EWSs. The topic is largely relevant for the landslide community and addresses a very common problem.

The language is fluent and correct and the work is well designed and presented, although some improvements can be made, resulting in overall minor revisions.

Your efforts and feedback are much appreciated. We have tried our best to address your following concerns.

Concerning the design, while it is interesting that you have studied as many as 12 different scenarios, some of them are not very likely to represent actual landslide behaviours. In particular, I strongly recommend that you include among the scenarios a power law increase representing a tertiary creep, which is probably the most relevant trend to be detected for an EWS. Also stepped lines (that is time series characterized by cycles of seasonal activations and stabilizations) would be interesting to be studied.

The reason of studying numerous scenarios was to make the case on differentiation between harmonic and instantaneous scenarios; otherwise, it would seem random if just one or two of each were investigated. Regarding the stepped trend, we believe that because of the versatility of the framework studied here, it is already addressed as it would be a sequential combination of the scenarios presented in our work. In numerical analysis on synthetic database, the concluding remarks are valid for new trends made by mosaicking the scenarios presented in this manuscript. As an example, by putting scenario 10 two times diagonally on top of each other as presented in the Figure 1, a stepped trend would be achieved. In Figure 1, also the filtered results after application of all three filters at BR=0.10 on unfiltered data with n/t=0.15 are shown as well. For the interest of readers, we have analyzed this specific case. In Figure 2, RMSEd of this newly generated case is presented and the same behavior as presented in the manuscript is observed. We should add that the results of this scenario were found to be independent of *n*/*t* ratio similar to the scenarios studied in the manuscript. The increase of error in S-G results in comparison with scenario 10 can be attributed to two incidence of pulsating effect in stepped scenario as there are two instantaneous changes.

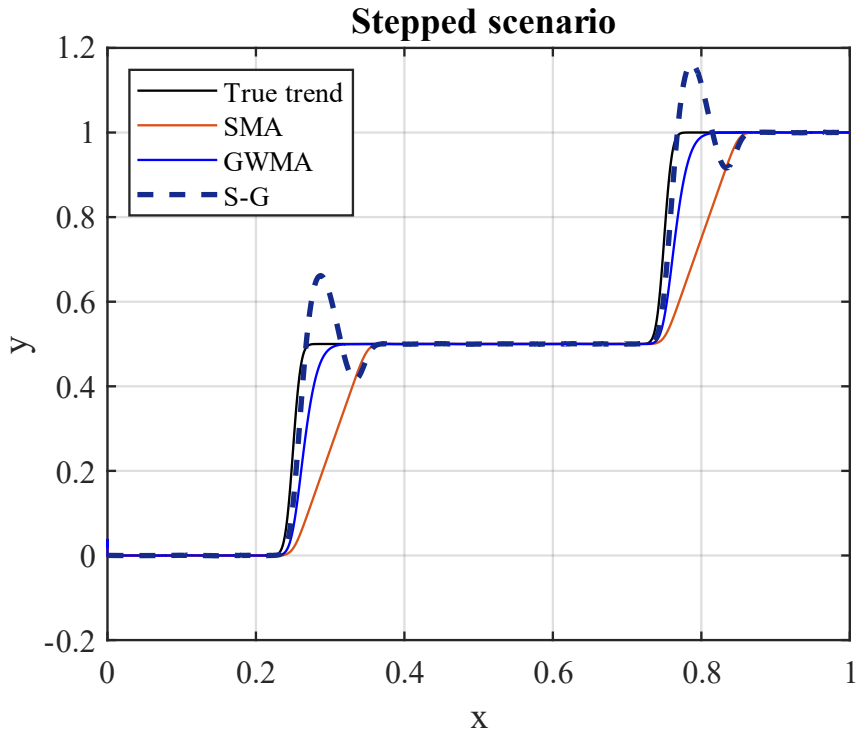

Figure 1. Stepped scenario generated using scenario 10 along with filtered results at BR=0.10 and n/t=0.15.

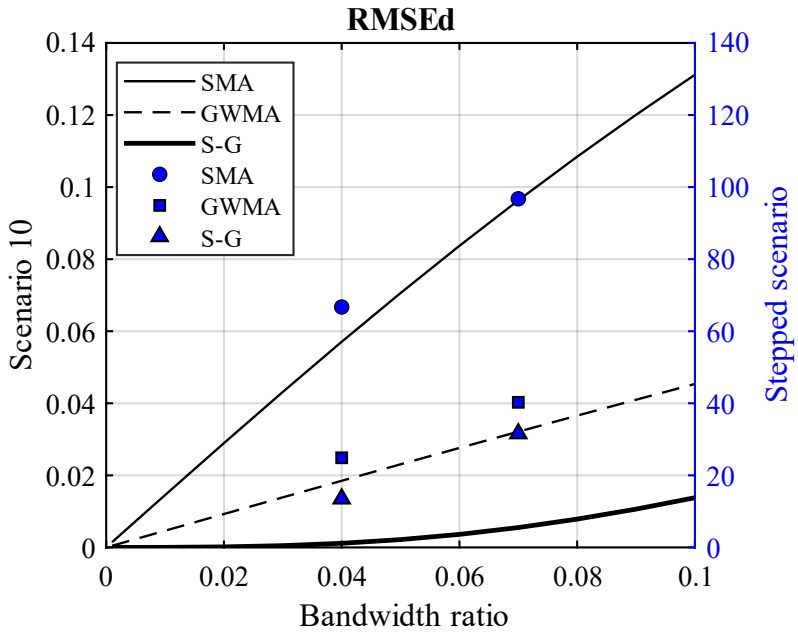

Figure 2. RMSEd of scenario 10 and stepped scenario

Power law motion trend developed based on creep theory has an asymptotic behavior near the failure which based on the method presented in this paper cannot be mathematically normalized. This is true for both displacements and velocity values. As a result, the inverse-velocity diagram should be normalized which goes beyond the direct and indirect filtration methods discussed in this study. Here, only those normalized scenarios were studied that either themselves or their derivation can represent the trend and have finite values. All being said, authors would like to disclose that our intention was to establish a quantitative foundation for investigating the performance of these three filters as no such study has been dedicated to that. In this regard, the following questions are addressed: how should we select a filter bandwidth, if the application method of filters (direct or indirect) would impact results, how much the filters preserve/distort the trend, and how much lag is created when simulating real-time monitoring. Having the accumulated knowledge after answering these questions, another thorough study regarding the reliability of filters on detecting onset of acceleration moment, and forecasting failure time based on Fukuzono's method is being finalized based on the established mathematical framework in this manuscript. As stated earlier, for failing scenarios, the inverse-velocity values were normalized. The results are prepared in the form of a manuscript and will be presented to the scientific community upon publication of this paper.

On the other hand, concerning the presentation, the results and discussions section would be better subdivided into subsections. One subdivision could be between results (objective description) and discussions (interpretations and comments). Further subsections could be added to improve readability and to separate different concepts and contents more effectively, both in the results and in the discussions sections. For example, the discussion section could be subdivided into 4 subsections, one for each filter that you analyzed, pointing out the advantages and disadvantages, and a final one to make comparisons, determine which one is better and in what circumstances and deliver the take home message. In particular, the take home message could be better highlighted, evidencing what is, in your opinion, the best filter in an operative situation. For example, in case one wants to apply Fukuzono's method, what filter would work best? And would you suggest a direct filtering on the inverse velocity (typically affected by peaks and strong variations) or an indirect filtering on velocity or even on displacement (typically presenting a power law acceleration before failure)?

Section 4.1., which contains the results of synthetic cases analysis, will be divided into multiple sub-sections for better arrangement of remarks. Moreover, formerly Figs. 11 and 12 are now relocated to follow the J_2 results as referee 1 suggested this would help reader's visualization of filters' performance, and authors also agree. Additionally, a "Discussion" section will be added to summarize the main takeaways of this study.

Regarding your examples, direct and indirect filtration found to be not significant in the results of this study. However, especially for Fukuzon's method, in the follow-up study mentioned earlier, we observed on both synthetic and real-world failed cases that again how one may apply the filter (direct or indirect) did not influence the outcomes.

Following are just few minor suggestions:

Line 132: "based on scaling" can be probably simplified into "by scaling".

309: you make reference to scenario 6 relative to fig 6 while in the caption of fig 6 there is no mention of any scenario.

534: please replace overstate/understate with overestimate/underestimate.

All of the above suggestions/concerns will be addressed in the revised manuscript.