

Interactive comment on “Multi-temporal landslide activity investigation by spaceborne SAR interferometry: Polish Carpathians case study” by Kamila Pawluszek-Filipiak et al.

Anonymous Referee #3

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The main goal of this manuscript is to present the updated state of activity of landslides in Małopolskie municipality, a rural area with sparse urbanization in the Polish Flysch Carpathians, based on InSAR results. At a glance the manuscript seems to be a good case study, carried out according to state-of-the-art methodologies published and highly cited in the specialist literature. However, after a careful reading, it comes out that there is no element of novelty in both the InSAR processing & post-processing methodology and contribution to advance the field of landslide studies. The area where this manuscript could bring in a novel contribution could be the improved knowledge about local landslides in Małopolskie and the risk that they pose to population, buildings and infrastructure. However, despite the field validation, it is difficult to relate the

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conclusions achieved by the authors based on InSAR processing and analysis with the challenges that this area in the Polish Carpathians is experiencing.

So in general I believe that this manuscript (and the research behind it) requires more work to be publishable.

Further detailed comments are reported below.

Abstract It can be improved by removing redundancies (e.g. lines 12-13 vs 18), making explicit the cause for 7 landslides out of the total 50 that could not be confirmed, and highlighting the novel contribution with regard to either methodological approach or knowledge about local landslide issues and the risks that they pose (see also what the authors state at lines 84-87).

Introduction The strength of this section is for sure the wide and comprehensive literature review. Key and relevant papers are cited. However, although at line 72 the authors start listing the objectives of the manuscript, it is not clear how these objectives relate to the literature reviewed in the previous paragraphs. In which way is this manuscript novel (if it is) compared to the cited literature? The feeling is that the authors primarily wanted to ensure that their methodology was aligned with the literature.

Figure 1: it is not clear whether the landslides mapped are those from the pre-existing inventory, i.e. prior to the update based on InSAR. The caption should be more explicative

Methods The methodology is in general correct because it largely relies on well established and accepted methodologies. However, it is difficult to see it framed within the specific geological, geomorphological and environmental features of the study area landscape. Therefore, although they may be correct, the rationale for the implementation of some of the assumptions is difficult to understand. At what extent the knowledge of the local landslides helped the authors to shape and adapt the methodology? With regard to PSI, some key information are missing in the text (or I was not able to find

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myself), e.g. the location of the reference points selected during the processing.

Figure 3: there is a typo in Feretti et al.; it should be Ferretti et al.

Furthermore, in the text I did not find the explanation of the rationale followed by the authors for processing first Sentinel-1A data only and then Sentinel-1A + Sentinel-1B data together. Would not it be better to process directly Sentinel-1A + Sentinel-1B data together? What is the advantage of this approach? More in general, what is the impact of each satellite dataset on the state of activity?

Discussion I would have expected more linkage between the evidence gathered during the field validation and the InSAR data. When did the damages observed in the field happen? Is there a temporal association/correlation between the displacement showed by InSAR data and the damages?

Given the current statements at lines 432-436, it is not clear how the authors assessed the degree of damage to buildings and infrastructure.

Several minor typos throughout the text need to be corrected, e.g. - line 16: "filed" to be corrected into "field" - line 181: "Feretti et al." to be corrected into "Ferretti et al."

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