

Dear Authors,

I have now examined the reviewers' comments, your replies, and the revised manuscript. Both reviewers stress the importance of this work, presenting the use of IMU technology for tracking boulders and thus landslide movements, in addition to recognizing the substantial effort that went into this study. I think you did a very nice job addressing the comprehensive comments. However, there are a few minor comments I would like you to address before the manuscript is ready for publication.

Dear Dr Polvi Sjöberg,

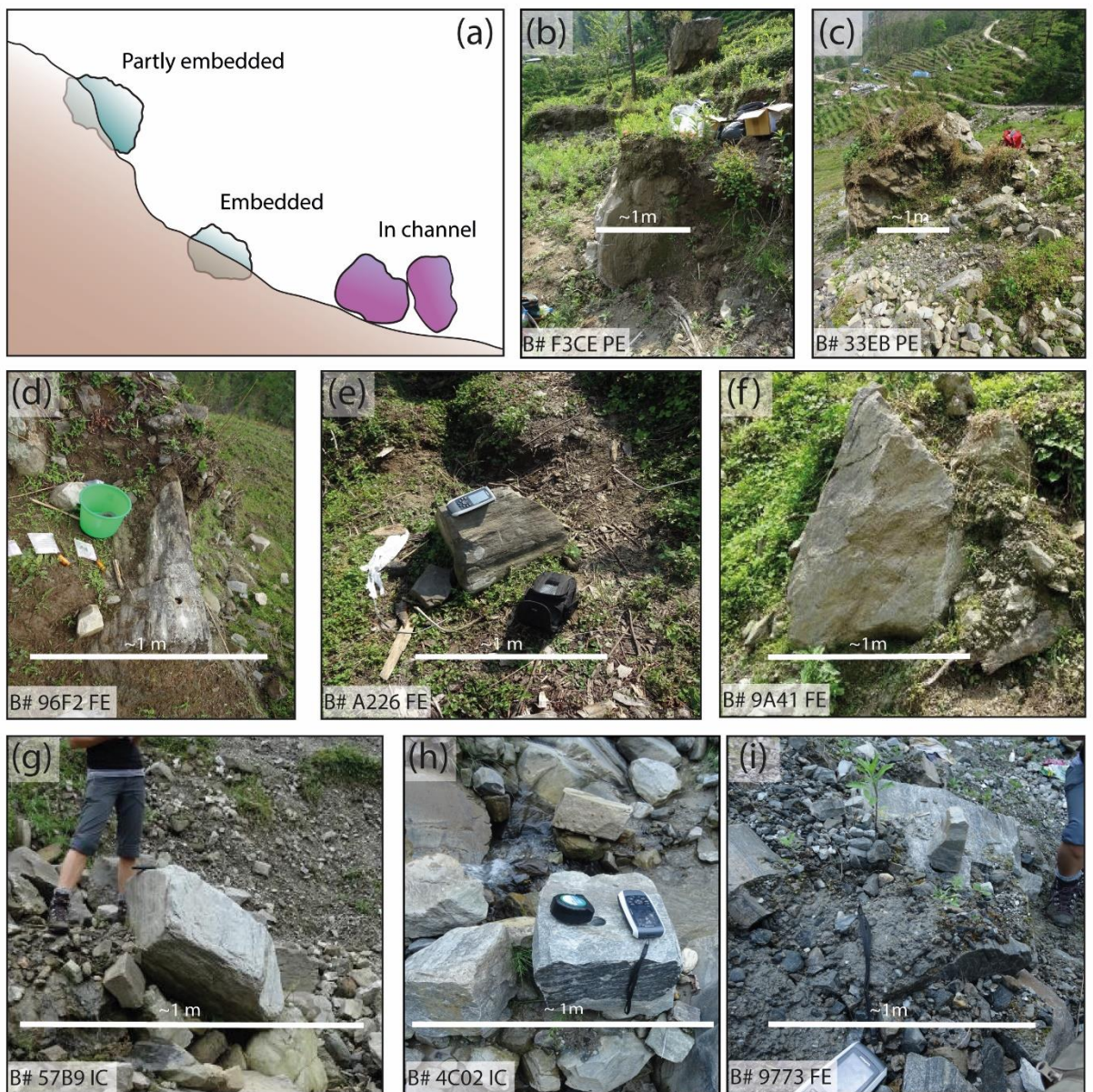
thank you very much for taking the time to examine the revisions and our response to the reviewers and for giving us some additional suggestions. We have addressed your comments and hopefully improved the manuscript to the required standard.

- You clarify in the response to reviewer 1's comment that "the main point of this paper is not that of offering a 3D representation of boulder movement" and that "the main point of this first paper is to show that this technology might mature quickly in the near future to provide real time data on the initiation of hazardous boulder movement, which we believe our data already highlights, despite the capability limitation at the time of data acquisition." However, in the Discussion it could be interpreted as if you are contending that the main point of your paper is to show 3D representations of boulder movement ("this indicating the potential of the technology used for detecting both gradual angular variations and changes in boulder orientation associated with rapid movements in real or near real time"). Please clarify your text in order to not overstate the realistic objectives/outcomes of this paper.

We tried to make this a little clearer in the first paragraph of the discussion. What we mean is however what is already written in this paragraph. Basically, even though we do not aim here at offering a 3D representation of boulder movement as it unfolds, we are able to capture the moment in which the movement initiates. Movement onset occurs in the form of some change in the x,y,z orientation of the accelerometer axis. This change, as we show in the results, can be small and gradual or much larger (and we assume the latter corresponds to larger movement, the full development of which we don't capture due to GPS delay and sampling frequency).

- L114: This sentence is missing a word. Either add 'us'/'researchers' after 'allow' or change 'to investigate' to 'investigation of' **Done.**
- L140: This sentence is missing a word. One suggestion is to add 'providing' before 'the potential' (remove comma before 'and') **Done.**
- L169: 'PGA' has not been defined previously in the text. **True, made explicit.**
- Figure 1: Pink box showing 'Zoom Fig. 4' is quite hard to see. **This has been made lighter and thicker.**
- L287: change to 'a 4-panel solar system' **Done.**
- L304: Change to either: 'have a b-axis of' or 'have b-axes of' **Done.**

- L324: A word is missing here: 'in the following \_\_\_\_\_'. Should this be text, paragraph, section? [Done](#).
- Figure 3: Are the measurements given on the scale bars the b-axis measurements? If so, please add that information in the caption. If not, why choose such different scale bars and not use a consistent measurement of 0.5 or 1 m? [The 1 m scale will be different for each photo anyway, which will make the figure look less tidy. We decided to show the dimension of the boulder in the plane of the photo for a more immediate reference. We have changed the figure using a consistent 1m reference, but we would prefer the original version.](#)



- Figure 5: Please describe the different elements of the figure in alphabetical order (i.e., A & B before C-G) **Done**.
- Figure 6: As the reviewer required additional explanations of how the representations were created in Fig. 6B, D, F, I think it could benefit readers to include equations (1) and (2) (from the 'Author response') together with a brief explanation in the text.

This is fine, perhaps it would be best to have it as a small supplement (appendix 4), since it is only the application of the equations of pitch and roll angles to our accelerometer data. Also, if you think it may be even better, we considered the possibility to remove figures 6B, D, F if these add more confusion than they help visualise what could have happened to the boulders.

- Figure A3. The yellow text and arrows are quite difficult to read; please choose a more distinct color. **Changed**.

On behalf of the authors,  
Benedetta Dini