Dear Giulia Sofia,

We have taken into account all comments raised by the reviewer Pascal Lacroix and have modified our manuscript accordingly.

Please find our replies to all individual comments attached.

Best regards,

Ariane Mueting

on behalf of the authors

Reviewer comments

Author comments

Authors made substantial changes to improve the quantitative assessment of their processing, and I would like to thank them for that effort. I also feel the flow of the reading improved thanks to the modifications realized. I feel the manuscript is almost ready for publication and requires two moderate modifications and then only minor changes listed below.

Thank you for taking the time again to review our manuscript. Your feedback is very much appreciated.

Moderate comments :
Introduction :
As the introduction is turned, it gives the impression that there is no previous work to reduce orthorectification errors in PlanetScope images. In fact, the authors chose to describe this work in part 3.2 'Past Approaches to improve scene-to-scene coregistration' and in part 4.4.2. I understand that it is first necessary to describe the geometry of PlanetScope acquisitions before describing the approaches used. Having said that, I think it would be more honest to put somes sentences about previous works in the introduction, for example just after line 41, to show that your study fits into a general context. The whole section 3.2 would fit perfectly in the introduction. If you don't think so, please summarize it in a few sentences to add it in the introduction.

We have moved the entire section 3.2 to the introduction, as suggested.

Discussions of the velocity time-series on the two landslides investigated :
In the present state, authors decided to show the time-series of velocity, without much interpretations. The interpretations of the time-series are only expressed in the conclusions in two sentences. I still believe (as my previous round of comments mentioned) a more in-depth discussion of the observed velocities is required. Indeed, the authors decided to submit their study in E-surf, which is a journal dedicated to better understand surface processes. So the application seems to me quite important.

We have elaborated more on the interpretation of the observed velocities, in particular on the potential seasonal control of the Del Medio landslide, see lines 466-474 in the revised manuscript. The focus of our work, however, is to assess the impact and mitigation of errors in satellite-based measurement of surface displacement. This is the reason why we keep the interpretation of the specific velocities at our test sites rather short.

Minor comments :

Abstract : Please change the range of velocity of Slow-moving landslides for 1-100 m/yr to be consistent with the velocity of the landslides you are investigating (Siguas reaches 40 m/yr). This also appears several times in the manuscript (Line 155, elsewhere...).

We changed all instances to 1-40 m/yr.

Lines 164-165 : change « make it nearly impossible…. » for « lead to large uncertainties on the horizontal displacement ».

Changed.

3.1.1 : if you choose to still use both EW and dx (NS and dy) please define them first time you use them (In its present state it is described in Caption of Figure 6). I still think it would be easier to have only EW/NS and remove dx/dy.

We have now indicated that we refer to EW displacement as dx and NS as dy upon first occurrence (see lines 244-245 in the revised manuscript). Both terms are known in the scientific community so we choose to keep them.

3.2 : This section is an introductory paragraph to explain the previous works realized on the investigated topic. I believe this should be placed in the introduction.

We have moved this section to the introduction, see our response to moderate comment #1.

Lines 281 : Could you precise the dates of acquisitions of the 2 DEMs (Copernicus and NASADEM) ?

We have added the acquisition years for both DEMs.

Lines 287-296 : These sentences could be added in the introduction to explain the previous approaches.

We have left these sentences in place, because we believe other studies using PlanetScope data for DEM generation are best explained jointly with our own 3D processing workflow. However, we have moved the entire section 3.2 to the introduction to provide a reference to previous approaches earlier in the manuscript, as suggested by the reviewer (see our response to moderate comment #1).

Lines 329-330 : The sentence is not clear. Either reformulate or explain the wording « image space » and « object space » .

We have added explanations (see lines 323-326 in the revised manuscript):
“When two unprojected L1B scenes are correlated in image space (pixel coordinates, i.e. rows and columns) and the obtained correspondences are transferred into object space (geographic coordinates, i.e. longitude and latitude) using the given RPCs and a DEM, the displacement between the projected pixels should be zero.”

Figure 9 : Could you please change the order of the image subsets B/C E/F to be consistent with the order of the Figure 8, where results with the NASADEM appears before the results for Copernicus ?

We have reordered the panels of Figure 9 accordingly.

Line 345 : « disparities » is still appearing. Can you change that ?

All occurrences have been changed.

Line 405 : « displacement velocity » : not clear. Do you mean « velocity magnitude » ?
Line 408 : replace « velocities » for « magnitudes »

We have changed all occurrences of “displacement velocity” to “velocity magnitude”. Velocity is a vector with magnitude and direction.

Figures 11 and 12 : « displacement velocity » : not clear. Do you mean « velocity magnitude » ?

Yes. We have changed all occurrences of “displacement velocity” to “velocity magnitude”, see previous comment.

Figure 15D : Could you zoom the y-axis to better see the kinematic variations of the landslide ? For instance between 0 and 10 m/yr ?

We prefer to keep common y-axis limits for both landslides to allow for a better visual comparison of velocity magnitudes and error bars.

Conclusions : the interpretation of the time-series are only expressed here in two short sentences. I still believe a more in-depth discussion of the observed velocities are required, as the authors decided to show the time-series of velocity and submit their study in the E-surf journal, dedicated to surface processes.

See our response to moderate comment #2.