Response to Reviewer #1.

- We changed the title, substituting 'Landforms' with 'Landslide Deposits'. We also modified 'landforms' in the abstract, as suggested.
- I am wondering if there are as well "non- long runout" landslides that have developed longitudinal ridges? If not then I personally don't find it necessary to add "long runout" every time.

We are not aware of any case of landslides that is not long runout exhibiting longitudinal ridges. However, we think that it is important to use the 'long runout' as it highlights the link between the development of the ridges and this type of landslides.

- Did you identify all longitudinal ridges with the available DEMs or as well from differences in vegetation and/or shadows in RGB imagery? Add one sentence about that to clarify your approach.

We specified that we used high-resolution satellite and aerial imagery in the first sentence of this section. In the first sentence of the introduction, we specified that longitudinal ridges *'are features visible at the surface of the deposit and extend parallel to the direction of movement'*. We do not think it is necessary to add another sentence as we did not use vegetation or shadows.

- this is a misleading description of paleosols. At least I am assuming you are referring to the red interbeds/redbeds between the lava layers. those are old soils that may be of basaltic origin but not necessarily. I would simply rewrite to: "..... of Tertiary basalt lava flows alternated with softer, red interbeds (paleosols).....". as well, in case you are writing in british english then palaeosols is the correct spelling

We used the description given in the literature (see citations). However, we removed 'vescicular basaltic'. Unless the editor has different opinion, we are ok with the spelling' paleosols'.

- I find this difficult to understand. what to you mean by "inclined surface"? the mountain slope itself? please clarify.

We have added the following part in order to clarify (now lines 236-238): '*Such connecting surfaces have slopes of about 8□-15□. They correspond to sedimentary units, whose origin cannot be established from remote sensing only. A river gorge near the Dalvík landslide exposes outcrops showing the sedimentary origin of the inclined surface over which the landslide deposited (Figure 5c).*'

- What I find very interesting is that the H/L ratio of the Icelandic and Martian means is basically identical (0.293 vs. 0.297) [plus many other comments on this section]

As also raised by Reviewer 2, this section has some issues in explanation and reasoning. We have modified the entire section 5, which is now divided in Section 5 and 5.1. As part of this modification, we added this sentence: '*It is interesting that these two populations with equivalent L (that is, with assumed equivalent volume) show similar mobility (Icelandic average H/L ratio = 0.303; martian average H/L ratio = 0.292), thus supporting the absence of distinctive trends of mobility in small-scale terrestrial and martian long runout landslides.*'

- This comparison is problematic. Instead of focusing on the total numbers of the respective populations in the databases… / Explain how different conditions on Mars and and Earth can lead to this overall shift. /

As also raised by Reviewer 2, this section has some issues in explanation and reasoning. We have modified the entire section 5, which is now divided in Section 5, 5.1, and 5.3 (we did not modify section 5.2). We addressed the raised issues in the newly written section 5.1

- it can be confusing for some readers if you talk of long runout landslides and then suddenly call them small-scale.

In order to better express the concept of small-scale long runout landslides, we added/modified several sentences throughout the manuscript.

Now lines 43-46: '*Therefore, the definition of a long runout landslide is not based on the final horizontal length of the deposit. In fact, the final horizontal length of long runout landslides can range across two orders of magnitude, from less than a kilometre to tens of kilometre (Legros, 2002, and references within). However, it appears that a volume threshold (106 m3) exists, below which landslides do not develop a long runout (e.g., Heim, 1932; Legros, 2002).*'
Now lines 134-136: '*In total, we selected 112 landslides. As martian landslides can be up to 70 km long (Lucchitta, 1979), those selected for this work will be also referred to as 'small-scale', as done in the literature (Guimpier et al., 2021).*'

- do you mean conditions? - could you specify what mechanism(s) you mean? are this slide specific dynamics or climatic changes/conditions that led to more frequent long runout landslides on Mars and to a lack of recent long runout landslide activity?

These are exactly the things that remain unresolved in the study of long runout landslides. We did not make any changes.

- figure 1, 4 and 6 could be combined into max 2 or even a single figure

We did not make any changes.

- We modified axes' caption and added scale bar in Figure 6
- (Figure 1) marking the panels with a and b makes it much easier for the reader / add the view direction used in of the right panel to the left panel

We added letters to the panels. We added a drone symbol and an arrowhead to show the view direction in panel b

- (Figure 13) please add that in the caption for the y and x axis. For more intuitive reading of this I would recommend to add more numbers to the y axis. Furthermore, I find it easier to read if you just write out the numbers instead of using the exponential format / mark the Davík landslide and the Martian landslides from fig 8 in the lower two lots too / a Figure numbering a-c would be useful

We made the recommended changes.

Comments from the Supplementary Materials:

- In a and b it would be helpful for the reader to add contours or some other way to gain perspective of elevation

  The purpose of the figure is to show the partially buried landslides. Although we appreciate that providing perspective of elevation would be a plus, we do not think it is fundamental for the purpose of the figure. Therefore, we did not add contour lines.
- turn c and d so the black arrows point in the same direction as on the left panels

  The two panels are orientated so that the North is towards the top of the images. The two panels are derived from the same landslide so the different direction of the flow (represented by the black arrows) is consistent with the spreading of the deposit. We did not make changes to the figure.