Reply on RC2

In the responses below the reviewers' comments are in black and our responses are in red.

This manuscript describes an extensive comparison among DInSAR measurements obtained by C- and L- band satellite data for landslide monitoring in alpine regions. Data acquired by a car-borne SAR sensor are also presented, complementing the information obtained from satellites.

The paper is very clear in its concept and structure. Several experimental results support the conclusions that are clear.

I have some minor comments that I think could improve the manuscript.

We thank the reviewer for their positive assessment and constructive suggestions regarding our manuscript. In the responses below, we address these suggestions and explain the changes we will make to the manuscript.

a) Table 1-2: it is not clear how to identify Stripmap and ScanSAR data. Please, add this info here or in the corresponding appendix tables.

Agreed, we will indicate which are the Stripmap and ScanSAR data in Appendices A to C in Tables A1, B1 and C1.

It would also be useful to indicate the mean look angle, which in mountainous regions could be in some case critical.

Agreed, a table with the mean azimuth and incidence angles for each satellite and area of interest will be included in the revised manuscript. lv_theta is the SAR look vector incidence angle and lv_phi is the SAR look vector orientation angle (0° → East, 90° → North).

Site	Sensor	lv_theta	lv_phi
Monte Mater	ALOS-2 PALSAR-2 A199-F2-7	41.8°	-170.5°
Monte Mater	ALOS-2 PALSAR-2 D095-F2-5	33.5°	-10.7°
Monte Mater	SAOCOM-1 Asc S3 T214	31.8°	-169.1°
Monte Mater	SAOCOM-1 Desc S4 T112	36.2°	-10.4°
Val Canaria	ALOS-2 PALSAR-2 A199-F2-7	38.9°	-170.0°
Val Canaria	ALOS-2 PALSAR-2 D095-F2-6	37.6°	-10.2°
Val Canaria	SAOCOM-1 Asc S4 T215	36.3°	-169.6°
Val Canaria	SAOCOM-1 Desc S3 T113	32.0°	-10.9°
Brienz/Brinzauls	ALOS-2 PALSAR-2 A199-F3-8	43.5°	-170.7°
Brienz/Brinzauls	ALOS-2 PALSAR-2 D095-F2-5	32.8°	-10.8°
Brienz/Brinzauls	SAOCOM-1 Asc S3 T214	33.4°	-169.3°
Brienz/Brinzauls	SAOCOM-1 Desc S4 T112	35.3°	-10.5°

b) L312: do you mean 2024-2025? In any case, I would detail the temporal span: October 2024-June 2025.

Correct, a wrapped differential interferogram for descending SAOCOM-1 data from 14 October 2024 to 11 June 2025 is shown in Fig. 5a. We will update the text at L312. Thank you for bringing this error to our attention.

c) In Fig4a-b, 6, 9, A2, B3, C4 some shadow/black areas are present but no information for their interpretation is provided. Please, explain.

Correct, in some of the images, layover/shadow is shown in black or dark grey. This will be specified in the caption to the figures in the revised version of the manuscript.

d) Fig.5: I suppose Fig. 5 and Fig.4 shares the same view. However, in the case of Fig. 5, the background map is not useful for identifying the area because it is almost completely covered by the interferogram. Therefore, here, and also in general for all the other maps, please add the geographic coordinates to better localize the study area.

Agreed, we will add the geographical coordinates to the figures. In addition, for images that use the Swiss national map as a background, we will make it clear that the grid spacing is 1 km.

As a further suggestion, in Fig. 5b (and in Fig. 11a as well) please consider to make transparent the areas with no phase information, instead of representing them in black.

These areas are not without phase information; they are in shadow. In these representations, the shadow is not pure black, but has a spectrum of dark grey values. Therefore, it is not possible to set it to transparent, as some pixels would remain and make the illustration look unaesthetic and potentially misleading.

e) Fig 5a and Fig. 7: Please, explain why some part of the wrapped interferograms is masked out.

The part of the wrapped interferograms masked out is layover/shadow. This will be indicated in the caption to the figures in the revised version of the manuscript.

f) Fig 13a,c: SqueezeSAR -> SqueeSAR

Correct, SqueeSAR. This will be changed in the revision. Thank you for spotting this mistake.

g) Fig. 13d: Caption states GNSS pt. 5001 while panel shows GNSS pt. 800. Please, correct.

GNSS pt. 5001 will be changed in the panel, thank you for spotting this mistake.

h) L486-487: probably "when a significant acceleration detected by the MTS was not recorded by ALOS-2 PALSAR-2"?

Correct, this sentence will be changed from “when a significant acceleration of ALOS-2 PALSAR-2 detected by the MTS was not recorded” to "when a significant acceleration detected by the MTS was not recorded by ALOS-2 PALSAR-2".

i) L535: I would mention the possibility to use the Pixel Offset approach, if applicable, that anyway has its own limitations.

Agreed, we will mention here the possibility to use the Pixel Offset approach in the context of analysis of the Brienz landslide and we will make reference to Manconi, A., Bühler, Y., Stoffel, A., Gaume, J., Zhang, Q., and Tolpekin, V.: Brief communication: Monitoring impending slope failure with very high-resolution spaceborne synthetic aperture radar, Nat. Hazards Earth Syst. Sci., 24, 3833–3839, https://doi.org/10.5194/nhess-24-3833-2024, 2024.

j) L536-541: "purely satellite-based analysis". I agree with the main point raised by the authors and I also agree with the authors' final statement at lines 568-570. However, I would mention here that this statement is related to the present satellite landscape.

Agreed, in the revision we will specify that our findings show the current limitations of a purely satellite-based analysis.

Indeed, future SAR missions acquiring with increased repeat pass and/or from multiple look angles would improve the satellite detection capabilities, even if the use of ground sensors will be probably always required.

In any case, having improved satellite constellations would allow us to optimize in situ monitoring resources.

With reference to Manconi et al. (2024) we also specify al L.538 and L.570 that satellite data available with sub-daily revisit times and at sub-metric spatial resolutions can be a viable alternative to manage slope instability operational scenarios.

k) Fig B2-B3: review the figure caption. It should be Val Canaria.

Correct, Val Canaria. Thank you for spotting this mistake.