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Comment on nhess-2021-333

Anonymous Referee #1

Referee comment on "Pre-collapse motion of the February 2021 Chamoli rock–ice avalanche, Indian Himalaya" by Maximillian Van Wyk de Vries et al., Nat. Hazards Earth Syst. Sci. Discuss., https://doi.org/10.5194/nhess-2021-333-RC1, 2022

Dear Authors,

The manuscript is written well and address the research questions defined by you. However, I have some suggestions/comments before the manuscript is accepted for publication in NHESS.

- Himalayan terrain many times induces decorrelations. due to its topography as well as vegetation. The authors have tried to implement simple DInSAR methodology and were unable to obtain good interferograms. Loss of coherence is the main challenge to the InSAR application in the area.

I am afraid that simple PSI technique will hardly yield any significant result. Even the techniques such as SBAS, SqueeSAR etc may also fail to produce anything. As a suggestion you can try A-DinSAR techniques such as SBAS or techniques based on distributed scatterers such as Quasi PS (Perissin & Wang, 2011; Razi et al., 2018) or SqueeSAR (Ferretti et al., 2011) in this region.

Perissin, D., & Wang, T. (2011). Repeat-pass SAR interferometry with partially coherent targets. IEEE Transactions on Geoscience and Remote Sensing, 50(1), 271-280.

Razi, P., Sumantyo, J. T. S., Perissin, D., Febriany, F., & Izumi, Y. (2018, August). Multi-temporal land deformation monitoring in V shape area using quasi-persistent scatterer (Q-PS) interferometry technique. In 2018 Progress in Electromagnetics Research Symposium (PIERS-Toyama) (pp. 910-915). IEEE.

Ferretti, A., Fumagalli, A., Novali, F., Prati, C., Rocca, F., & Rucci, A. (2011). A new algorithm for processing interferometric data-stacks: SqueeSAR. IEEE transactions on geoscience and remote sensing, 49(9), 3460-3470.

- A study has been done like this on the same study area. They have claimed that they have used PSI on the regional level.

Kothyari, G. C., Joshi, N., Taloor, A. K., Malik, K., Dumka, R., Sati, S. P., & Sundriyal, Y. P. (2021). Reconstruction of active surface deformation in the Rishi Ganga basin, Central Himalaya using PSInSAR: a feedback towards understanding the 7th February 2021 Flash Flood. Advances in Space Research.

- For Figure 6b, I suggest the authors check all the available interferograms to confirm that the two areas marked with "Rock glacier motion" are always moving. From only one interferogram, it is hard to say the motion. The area marked with "Atmospheric noise" seems not so evident because there are some strange values in the surrounding area possibly caused by unwrapping errors due to the low coherence. If these areas can't be confirmed from other interferograms, I suggest writing these areas are possible rock glacier motion or possible atmospheric noise. I suggest also writing "2.8 cm" in the caption of Figure 6 after "wrapped phase".

- In figure 6b, I'm not completely sure about the "atmospheric noise". I suggest to check the displacement time series, if available, because atmospheric noise can be identified as strange peaks.