



Monitoring landslides covered by vegetation using interferograms of different wavelengths

Katarzyna Strzabała¹, Paweł Cwiakała², and Edyta Puniach³

¹AGH University of Krakow, Faculty of Geo-Data Science, Geodesy, and Environmental Engineering, Poland
(strzabal@agh.edu.pl)

²AGH University of Krakow, Faculty of Geo-Data Science, Geodesy, and Environmental Engineering, Poland
(pawelcwi@agh.edu.pl)

³AGH University of Krakow, Faculty of Geo-Data Science, Geodesy, and Environmental Engineering, Poland
(epuniach@agh.edu.pl)

Detection of spatial and temporal deformations of landslides, along with the acquisition of precursor information, is crucial for hazard prediction and landslide risk management. Contemporary landslide monitoring systems based on remote sensing techniques (RST) play an important role in risk management and provide important support for Early Warning Systems. Research into the feasibility of using RST for monitoring different types of landslides also includes an analysis of the impact of radar wavelength on the obtained displacement results. The paper compares the time series results of landslide displacements obtained from satellite interferometric imaging in the C-band and L-band. The focus has been particularly on analyzing how the radar wavelength can impact the accuracy of the obtained displacement values and the ability to penetrate dense vegetation, especially under conditions of varying vegetation density. This poses a significant challenge for correct displacement detection. The obtained results are particularly relevant for geographical areas, such as Poland, where a large number of landslides occur in regions covered by dense vegetation. These are the conditions under which scientists encounter the greatest challenges in accurately monitoring these areas using radar systems. The final findings of the research are an important contribution to the development of landslide risk management strategies, crucial for the safety of people and infrastructure.