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Inferring The Impact Of Vaia Storm On Slopes Stability Using Sentinel-1 Data.

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The Mediterranean storm “Vaia” hit the north-east of the Italian Alps at the end of October 2018. The strong wind gusts exceeding 200 km/h and the intense precipitation damaged more than 42,000 hectares of forests and caused floods that had a severe impact on the geo-hydrological balance of mountain basins. One of the most affected area, the province of Belluno, still bears the clear signs of the destructive effects of this extreme meteorological event, nevertheless the long-term impact on the slopes stability is yet far to be assessed. This study investigates the “Vaia” storm impact by analyzing time-series of the interferometric data acquired since 2015 by the European Space Agency’s Sentinel-1 mission. Radar interferometry is, at present, the only technique capable to measure small ground displacements of large areas over long time periods. The rationale of the proposed approach assumes that changes in the response of radar targets, located over slopes, are proxy of change in the style of activity of landslides and in particular of their activation, re-activation and acceleration. The purpose is to evaluate the possibility to detect a statistical relationship between the occurrence of “Vaia” storm and the state of activity of mass movements. This type of analysis could be useful in helping to interpret the impact of extreme meteorological events on the landscape and in developing strategies for mitigating potential risks in the next future. This research is carried out in the framework of Project VAILAND, a joint research agreement funded by the Veneto Region (Italy).