

## Seismic response of earthquake susceptible rock slopes

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The recent events in China (2008 M7.9 Wenchuan), and Nepal (2015 M7.8 Gorkha) highlighted the importance of earthquake-induced landslides, which caused significant losses. In order to reduce the costly consequences of such events it is important to detect and characterize earthquake susceptible rock slope instabilities before an event, and to take mitigation measures. For the characterisation of instable slopes, acquisition of ambient vibrations might be a new alternative to the already existing methods. In particular, conventional displacement measurements fail to detect slopes in dormant state, which could still fail during an earthquake. The proposed method estimates directly the seismic response, but it has the potential to deliver valuable information about the internal structure and the current state of the unstable rock mass as well. The recent results of an extensive measurement campaign will be presented, covering a broad class of slope failure mechanisms and material conditions. Instable rock slopes show a highly directional ground motion, which are significantly amplified with respect to stable areas. Extreme amplifications (factors of 70) have been observed. The systematic measurements have resulted in a world unique database of unstable slope seismic responses, which serves for the monitoring of potential changes in the unstable rock masses and as a base for the interpretation of potential future landslides triggered by earthquakes.