



Application of the Refraction Microtremor technique to investigate the characteristics of seismic response of landslide-prone hillslopes

V. Del Gaudio (1), N. Venisti (1), P. Pierri (1), J. Wasowski (2)

(1) Dipartimento di Geologia e Geofisica, Università degli Studi di Bari, Italy, (2) CNR-IRPI, Bari, Italy

The technique of the Refraction Microtremor analysis was tested within a study on the seismic response characteristics of landslide-prone hillslopes in the area of Caramanico Terme (Central Italy). In this area the accelerometric monitoring of 5 sites with different lithostratigraphic and topographic conditions provided evidence of peculiar properties of site dynamic response to seismic shaking, e.g. amplification and/or directional variations of shaking energy. To investigate the local conditions responsible for the observed site effects and to obtain geometrical and physical parameters needed for numerical modelling, recordings of microseismic noise were acquired near the accelerometric stations. These recordings were analysed to derive S-wave velocity vertical distribution from Rayleigh wave velocity dispersion. The results were also confronted with the borehole subsurface data available for 3 accelerometric sites. Potential and limitations of this technique were examined in relation to conditions commonly encountered in unstable slope areas. In particular the following aspects were investigated: i) comparability and robustness of results obtained at different times and with different acquisition parameters; ii) method sensitivity in discriminating conditions of sites with similar lithology but different mechanical properties; iii) method capability of revealing ground property anisotropy that could be responsible for the observed directional variations of local seismic response in slope areas.

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