



Near real-time electromagnetic monitoring system of the seismically-induced landslides in the Subcarpathians' area

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The main objective of this paper is to present the electromagnetic (EM) monitoring system that may provide in near real-time the landslide hazard level related to the intermediate depth earthquakes occurred in the seismic active Vrancea zone (Romania). The activities which have been accomplished are: (i) innovation in integrated geo-sensors structure for network conditions; (ii) implement and continuous improvement of the monitoring system depending on the landslide (test sites) conditions; (iii) data processing for pattern recognition in "pre disaster" circumstances; (iv) assessment and quantification of the EM precursory parameters related to both the intermediate depth earthquakes and landslide associated. Thus, the specific methodology and software packages have been applied for obtaining, in near real-time, all the important electromagnetic parameters and to point out their anomalous behavior versus the specific pattern pre-established in non geodynamic conditions. Consequently, by analyzing the data carried out at the Provita de Sus landslide (test site), placed in Subcarpathians' area, at about 100km far away of epicenter zone, it was possible to assign the increase of the landslide activity related to the local active fault which has been reactivated by the earthquakes of magnitude higher than 4, triggered in the Vrancea zone in a span of two years (2009-2010). In the end, this paper illustrates the stage of the monitoring system implementation and the results highlight the utility of merging the electromagnetic precursory parameters (normalised function Bzn, anisotropy, skewness and strike) with different 2D tomographic images related with post-seismic landslide processes. Subsequently, in the Provita de Sus-test site, it was possible to provide information regarding the both specific ground motion produced by the interference between seismic triggered factors with local geotectonic conditions and lanslide hazard level.