



## **Real-time electromagnetic monitoring system for landslides assessment due to the seismic activity**

**D. Stanica** (1), M. Stanica (1), C. Diacopolos (1)

Institute of Geodynamics of the Romanian Academy , 19-21 Jean-louis Calderon St.,  
Bucharest, Romania ( Email:dstanica@geodin.ro)

The goal of the paper is to present a specific electromagnetic (EM) monitoring system, to better understand its efficiency for broad application in the landslide study and risk mitigation. The main objective was to implement this complex system (based on electric, magnetic and electromagnetic techniques) that may provide real-time monitoring against the risk arising from landslides (test sites) triggered by the intermediate depth earthquakes (EQ) occurred in the seismic active Vrancea zone (Romania). The main activities that have been accomplished consist of: (i) implementation and continuous improvement of the real-time EM monitoring system depending on the landslide test sites conditions; (ii) real-time data processing for pattern recognition in “pre disaster” and “at disaster” circumstances; (iii) assessment of the electromagnetic parameters related to both the earthquakes characteristic to the seismic-active Vrancea zone and the landslides associated to the active fault. Thus, the specific methodology and software packages have been applied for obtaining all the electric, magnetic and electromagnetic parameters, 2D models and tomographies, to point out their anomalous behaviour versus the specific pattern pre-established in non geodynamic conditions. Additionally, by combining different data types and analysis techniques, and also by merging electromagnetic parameters with electromagnetic tomographic images and with low frequency electric signals occurred prior the stress to reach a critical value, a compelling dynamical paradigm, in which is emphasized a correlation between electromagnetic parameters and the earthquakes’ magnitudes, was carried out. Consequently, by analyzing the data from the Provita de Sus (test site), it was possible to assign the increase of the landslide activity related to the local fault which has been

reactivated by the EQ occurred in the Vrancea zone. In the end, this paper illustrates the stage of the system implementation and to what extent the results carried out in the Provita de Sus test site may contribute on understanding such kind of phenomenon in order to provide the information necessary for disaster mitigation.