



Changes of electromagnetic (EM) pattern generated by seismic activity

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The time variation of the electrical conductivity in the lithosphere, associated with fracturing processes and fluids migrations, may be considered to be a precursory activity of the intermediate depth earthquakes occurred in the Vrancea zone, only if there is the possibility of detecting it in the anomalous behaviour of the electromagnetic parameters. Thus, an optimum methodology of emphasizing the electromagnetic precursors has been developed by correlating the geoelectric parameters values with seismic events, taking into consideration their major changes compared to the standard deviation established versus the electromagnetic pattern characteristic to the geotectonic structure investigated. This prerequisite is fulfilled by the parameter $B_{zn}=B_z/B_{perp}$ (B_z is the vertical component of the magnetic field and B_{perp} is the horizontal component of the magnetic field perpendicular to the strike) which, normally, is time invariant for 2D structures, under non-seismic conditions. In this context, the recording system consists of two separated modules; one of them is used for the magnetotelluric data necessary for establishing the EM pattern (given by skewness and strike coefficients) of the observation sites (Surlari and Provita de Sus geodynamic observatories), and the other one, for continuous monitoring of geomagnetic field, having one of the horizontal component orientated perpendicular to the strike. As regarding the selection of the electromagnetic parameters with a precursory character, it is based on their capability to reflect the changes of EM pattern generated by seismic activity. The essence of the B_{zn} invariant usefulness as precursory parameter is related to its fast enough variation when the geodynamic conditions are changed. More exactly, this anomalous behaviour may appear some days before seismic events of $M > 4$ have been occurred, as the EM data carried out during 2005-2006 years have shown.