Electromagnetic methodology used to assess the short-term precursory parameters related to seismic activity

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This paper is focused on a specific EM methodology able to emphasize the short–term precursory parameters related to intermediate depth earthquakes occurred in the seismic active Vrancea zone. In seismogenic studies, the volatiles transport is one of basic features related to the both earthquake preparation and associated electromagnetic precursors. Taking into account the concept according to which the most of the rocks composing crust and upper mantle can emanate molecular hydrogen due to anhydrous minerals which must contain some water as impurity of OH- in their crystalline structures, it is also reasonable to suggest that in the lithosphere continuous geotectonic systems (deep faults) do exist and may represent ideal conducting channels. Thus, the research on the relation between spatial-temporal changes of the electrical conductivity and intermediate depth seismic events has become an important subject in this direction, and the dehydration of the rocks, associated with rupturing processes and fluid migration through faulting systems acting as high sensitive path reflected by the Carpathian Electrical Conductivity Anomaly (CECA), could be detected by means of the anomalous behavior of the $Bzn(f)$ and $Ron(f)$ parameters carried out throughout the frequency range 10-2 Hz – DC. According to the electromagnetic information acquired in 2010 year, correlated with seismic events (Mw higher then 4), it was relieved that: (i) Bzn and Ron parameters could be linked to the resistivity variation along the submerged conductive paths (CECA) through the lithosphere and their pre-seismic instabilities may be considered as hints of impending earthquakes; (ii) the earthquakes are mainly triggered during the instability period of the EM parameters, and when the stability and instability domains are very closed a superimposed effect occurred being also reflected by maximum values. The lead time is closed on 7-15 days before earthquake occurrence.