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An improved geodynamic model for the seismic active Vrancea zone, Romania

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The electromagnetic studies accomplished at regional level emphasize that the lithospheric structures of electrical conductivity are parallel and approximately superposed to the collision orogenic belts. These structures supply an enlightening image regarding the compression tectonic processes involved in their construction. No geodynamic model elaborated up to now may explain totally the connection between the high electrical conductivity of the Eastern Carpathians and compression orogenesis. For this reason, we concentrated to study the association between the high electrical conductivity anomaly of the Carpathian orogene and the structural features of the collision belt existing in the arc bend area of the Eastern Carpathians. More exactly, we are focused on identifying sin-tectonic/post-tectonic processes responsible for electromagnetic anomalies, also on the mark in depth and the lateral extent of various structures existing in the crust and upper mantle. Thus, by achieving some models derived from 2D inversion and forward modeling of the magnetotelluric data and 3-D tomographic images, new information concerning the collision zone of the Paleozoic structures with the Precambrian ones (East-European Platform), older in age, were carried out and an improved geodynamic model for the Vrancea zone was conceived, what involves some new concepts in assessing the associated hazard (intermediary depth seismicity) related to the torsion process of the seismogenic slab. On this way, this paper aims at supplying information regarding not only the deep structure, but also the geodynamics of the relic slab, which may be responsible for the trigger action of Vrancea 's intermediate depth seismic events.