



Active stress field and seismotectonic features in Intra-Carpathian region of Romania

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The Romanian Intra-Carpathian Region is located on the eastern half of Tisa-Dacia geodynamic block from the Neogene Carpathian-Pannonian Basin. The distribution of seismicity displays clear clusters and narrower zones with seismogenic potential confirmed by the damaging earthquakes recoded in the region, e.g. July 01, 1829 ($M_w=6.2$), October 10, 1834 ($M_w=5.6$), January 26, 1916 ($M_w=6.4$), July 12, 1991 ($M_w=5.7$), December 2, 1991 ($M_w=5.5$). The state of recent stress and deformation appears to be controlled by the interaction of plate-boundary and intraplate forces, which include the counterclockwise rotation and N-NE-directed indentation of the Adria microplate and buoyancy forces associated with differential topography and lithospheric heterogeneities. The stress field and tectonic regime are investigated at regional and local scales by the formal inversion of focal mechanisms. There can be observed short-scale lateral changes of i) tectonic regimes from compressive (reverse and strike-slip faultings) to pure extensive (normal faultings) and ii) variation of stress directions (SH_{max}) from NE-SW to EW and WNW-ESE towards Southern Carpathians and NS within Easter Carpathians. The changes in stress directions occur over a distance that is comparable to or smaller than the thickness of the lithosphere. A comparative analysis of stress tensor with GPS velocity/displacement vectors shows variations from parallelism to orthogonality, suggesting different mechanisms of crustal deformations. The major seismic activity ($M_w \geq 5.0$) appears to be generally concentrated along the faults systems bordering de Tisa-Dacia Block, intersections of faults of different ages, internal shear zones and with the border of the former structural terrains, old rifts and neostructures.