

Evidence for active tectonics in the South-West Carpathians Bend Zone

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The Alpine orogenic system is affected by continuous active tectonic deformation, as a continuation of the Paleogene-Neogene formation of the Carpathians during their tectonic transport in the present day position. The deformation process is proved by earthquakes, some of them very strong ($M_w > 7.0$) and at great depths (more than 100 km), such as the Eastern part of the Southern Carpathians (Vrancea Zone). The seismic activity along the Carpathian Arc is not restricted to the Vrancea Zone, other areas like South West Carpathian Bend Zone (SWCBZ) is affected by earthquakes. The SWCBZ is characterized mostly by shallow seismic activity of moderate magnitude. Frequently the events from this region appear in clusters, such as the recently recorded earthquake sequences from 2011 and 2013 in the Hateg Basin (HB) and Caransebes-Mehadia Basin (CMB). In this region the seismicity is concentrated along the major tectonic elements such as: Cerna-Jiu Fault, Oravita Fault and in the bounding faults of the Neogene Intra-Carpathian Depression (including the basins Hateg, Caransebes-Mehadia and Petrosani) and it is characterized by sporadic events mixed with clusters of earthquakes. The neotectonics involve also the SW Carpathian foreland area, along the northern rim of the Getic Depression, as proven by the seismic cluster in the Targu Jiu.

The aim of this study is to understand the origin(-s) of these earthquakes and their relationship with the current deformation of the Carpathian Orogen. In order to achieve this aim, we are using the geological known data integrated with geophysical and seismic recorded data to get a better view of the active tectonic of the region.