and along the Lepietnica Valley probably to the western margin of Mszana tectonic window. This tectonic line was presented also by Slovakian geologists and named Prosečno dislocation system.

The exceptional position of Orava Basin is documented by model of the top of crystalline basement where its the most lower position is manifested at a -18 km depth. On the geophysical map of Western Carpathians the course of axis of gravimetric minimum presents en-echelon pattern between Zážitivá sigmoid and Orava Basin (within rotated Orava Block).

Owing to support of the Committee for Scientific Research — grant No 6PO4E 020 08, the seismic studies (refraction and reflection) and evaluation of earthquake of 11 September 1995 was carried out. The seismic study documents the complexity of Neogene structures near Czarny Dunajec and is in good agreement with the result of gravimetric minimum presents en-echelon pattern between Zážitivá sigmoid and Orava Basin (within rotated Orava Block).

The gravity field of the eastern part of the Western Carpathians is based on local isostatic equilibrium by using published maps of topography, gravity field, thicknesses of sediments, crust and lithosphere and two-dimensional density modelling. A preliminary, two-dimensional gravity model is also presented along the Profile KP-X, which extends across the region investigated. Unfortunately, the interpretation can not be supported by available seismic refraction and reflection profiling observations, because they are missing in this region.

Density contrast between crust and upper mantle (+300 kg m\(^{-3}\)) and lower lithosphere and asthenosphere (−30 kg m\(^{-3}\))

**Neogene tectonic evolution of the Mecsek Mts (Hungary, Tisia–Dacia unit)**

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Prior to Neogene uplift Mesozoic beds experienced intense deformation which resulted in the formation of asymmetric anticlines, overturned beds, ramps of NW vergence. No significant post Mesozoic cover developed in Mecsek area. Five main tectonic phases were observed having close correlation with sedimentary cycles. The dating of these phases is possible on the basis of major Neogene discontinuity surfaces.

The first phase is an extensional one with NE–SW synsedimentary normal faults. The regional occurrence of these faults is well documented by the thickness map of Ottnangian—Eggenburgian (21–17 Ma) sediments. In addition indications of sinistral E–W strike-slips were also deduced.

The second phase is also characterized by extension. The NW–SE dextral and NE–SW sinistral faults of this phase were active in the Carpathian (Lower Miocene). The axis of \(\sigma_1\) has an N–S while the axis of \(\sigma_2\) an E–W orientation. This phase well correlates with the regional large-scale Carpathian–Badenian (17–13 Ma) E–W extension of the Pannonian Basin.

The Sarmatian – Lower Pannonian (13–9 Ma) transtensional phase includes the development of normal faults (NE–SW). At some locations left lateral strike-slip faults (ENE–WSW) were also observed. The continuation of this strike-slip fault also exists to the East and to West.

The Late Pannonian (7.5–6 Ma) phase appears in different tectonic style. Flexural beds, pop-up structures, overthrust toward the foredeep (both to the North and to the South) indicate this change of stress field, and the compression. The fold axes, strike-slips faults and overthrusts refer to \(\sigma_1\) axis of N–S. This compressional phase resulted in the rejuvenation of large-scale left lateral strike-slip faults located at the southern margin of Mecsek Mts. In relation to this faulting en-echelon anticlines and synclines were formed.

The latest deformation of Upper Pannonian–Pleistocene to Recent period is of extensional origin with dextral (E–W) and sinistral (NNW–SSE) faults. This phase \(\sigma_1\) is NW–SE) appears to be active nowadays, too.

**The gravity field of the eastern part of the Western Carpathians and its geodynamic implications**

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In recent years, the study of geodynamic evolution of the Western Carpathians has been concentrated mainly in their western and central segments. For an integrated study of the whole Western Carpathians it is very important to investigate also their eastern part. In order to constrain the lithospheric structure and geodynamics of the region a detailed analysis of gravity field is done. The analysis of the gravity field in the eastern part of the Western Carpathians is based on local isostatic equilibrium by using published maps of topography, gravity field, thicknesses of sediments, crust and lithosphere and two-dimensional density modelling. A preliminary, two-dimensional gravity model is also presented along the Profile KP-X, which extends across the region investigated. Unfortunately, the interpretation can not be supported by available seismic refraction and reflection profiling observations, because they are missing in this region.

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