

INTEGRATED GEOPHYSICAL, STRUCTURAL GEOLOGY AND PETROLOGICAL STUDIES OF THE CONTINENTAL LITHOSPHERE IN THE WESTERN CARPATHIANS

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It is well known that the continental structure and geodynamics of the Western Carpathians is very complicated. It means that the understanding of geological processes in such complicated region, as the Western Carpathians are, can be benefit only from interdisciplinary studies. The principal geophysical and geological methods which were used in our study are: seismicreflection, seismic refraction, gravimetry, magnetometry, heat flow, structural geology and the upper mantle xenoliths. In Slovakia the Atlas of deep seismic sections of the Western Carpathians was published. Up till now, data have been obtained along more than 1260 km of profiles. Here we illustrate the multidisciplinary approach and the results of transect syntheses for the Western Carpathians and its vicinity. This research has resulted in integrated geological and geophysical model of the current lithosphere structure in the Western Carpathians. In the upper crust the contact between Carpathians units and European platform is documented by flat northvergence overthrust of Flysch zone. Complicated flower structure of the Klippen Belt was interpreted as a system of transform Tertiary fault zone at the tectonic contact between the Central and External Western Carpathian units. The deeping of the underthrustured European platform is very steep. The model expresses the Alpine-type structural character of the Central and Inner Western Carpathians. The Alpine tectonic units are characterized by northern vergency. Tectonic contact between the Inner Western Carpathians and the Pelso megaunit represents the Raba-Hurbanovo-Diosjeno transform fault zone of Miocene age. Neotectonic character of this mountain range estimated from fault patterns, recent stress field, recent vertical movement tendencies related to crust thickness and heat flow, position and character of the seismotectonic zones will be also discussed.