of space north of these elements they very quickly entered into collision with the collapsing European active margin during Late Carboniferous to Early Permian. Continuing translation of Gondwana westward provided some new space and a new rift appeared north of Tunisia-Sicily (the Sicanian-Lagonegro rift system connected to the Ionian sea-East Mediterranean basin). The western part of the Meliata back-arc rift (Southern Alps-Ivrea) aborted at that time, whilst its eastern part (Hallstatt-Meliata-Dobrogea) oceanised (e.g. Early Triassic MORB pillow lava of N-Dobrogea). During the Late Permian-Early Triassic collision of the detached inner Dinaro-Hellenides Variscan sliver with the Cimmerian elements.

## Characteristics of the lithosphere reflected upon electromagnetic parameters along the magneto-telluric profiles in Romania

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Information carried out along the eight MT profiles crossing the Eastern Carpathians and Pannonian Basin - Romanian area are used to reveal the most important aspects related to the lithospheric structure insisting on the suture zone associated to the Carpathian Orogen and Tethyan one. Taking into account the magnetotelluric (MT) results referring to the lithospheric thickness variations, contact alignments and structural relations between the main tectonic units and placement of the enhanced conductivity zones (over 0.1S/m) an explanation of the link between the lithosphere dynamics and crustal deformation is to be attempted. By means of the geoelectrical cross-section elaborated for every profiles, a general spatial image was pursued to be achieved. The MT profiles bring into the light some characteristic aspects emphasizing the structural particularities of these two major tectonic units. A first problem is related to the thickness of the sedimentary cover (1000 - 3000 m in Pannonian Basin) and (13000 - 18000 m in the Eastern Carpathians's Foredeep). The transition zone from the crust to mantle, marked by a decrease of the resistivity (less than 10 ohm.m) and associated esspecialy to Orogenic areas stands for the interesting point to be clarified, as regarding its affiliation on the hand, by means of the electrical properties and of the assesed depth, and the causes which generated it, on the other hand. Obviously, owing to its involvement in revealing certain lithospheric aspects, the top of the asthenosphere (contact between tectonic plates of various thickness) was pointed out where it was possible.

## East Carpathian-Pannonian connection according to geophysical data

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The geologic boundary between the East Carpathians and Pannonian Basin is eophysical data to be a part of the transcontinental Oder-Caucasian lineament separating the thick from thin lithosphere or hot from cold asthenosphere in Europe. Over this fault crustal thickness varies from 27-30 km in Pannonia to 56 km in East Carpathians. This boundary is very clearly seen in the geothermal field. The main thermal energy source is situated within Pannonia west of the Transcarpathian deep fault. The former caused lithosphere thinning and high-temperature asthenosphere formation under Pannonia at 60-65 km depth. Under the East Carpathians temperature decreases strikingly and the lithosphere thickens. The velocity, density and magnetic properties change. Here under the East Carpathians, the thin crust of the Pannonian basin is alternated by the thick lithospheric armour of the more than 65 km thick Cis-Carpathian through.

A rheological analysis of geophysical data enables us to express the following idea of the structure of this region. Under Pannonian basin the crust is thinned by high temperature to 28 km and thickens towards the Fold Carpathians. The sediments reach in the Transcarpathian through 5 km and rest on a young folded basement lying on plastic granites, which is demonstrated by high temperature (200° C) corresponding with granitoid creep. The plastic granitoids are underlained by 10-12 km thick brittle basites layer whose top is clearly traced by seismic data. The brittle-to-plastic basalts transition is not always a contrasting acoustic boundary and nearly coincides with the 520° C geotherm. The M-discontinuity separates in Pannonia basic from ultrabasic rocks which are in plastic state. The lithosphere thins to 60 km and has been destructed by high (to 1200° C) temperature.

In the East Carpathians bounded by deep faults crust thickens due to its doubling in granitoid and brittle basite layers. The M-discontinuity deepens even more in the Cis-Carpathian foredeep. This is due to sedimentary cover thickening and the appearance of a "crust-mantle mix" layer with 7.5-7.6 km/s longitudinal wave velocity. The large "crust-mantle mix" thickness is due to plunging of a layer of brittle basites ("basaltic plate") driven by high temperature from the Pannonian massif into the plastic upper mantle. Beyound the Cis-Carpathian through the temperature regime of the upper mantle is stabilized and the striking boundary between the lithosphere and asthenosphere vanishes.

## A magnetotelluric study of the high-resistivity basement of the Carpathians

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Complex geological structure of the Carpathians and limited information available from boreholes make the interpretation of the orogen basement difficult. In this situation, geophysical survey plays the basic role in solving problems related to the structure and the genesis of the Carpathian orogen. The magnetotelluric investigations have been conducted in the Polish Carpathians for 20 years (Jankowski et al 1980, Molek and Klimkowski 1991, Stefaniuk 1995). Magnetotelluric data were interpreted by many geophysicists. This presentation is based on the author's own interpretation of magnetotelluric soundings made along seven profiles transverse to the orogen axis and crossing regions with different style of the geological structure. The results of interpretation are presented as depth cross-sections and, for a case of the eastern part of the study area, as generalized structural outline of the roof of the consolidated basement (Stefaniuk and Kuomierek 1986). The investigations enabled one to outline the morphology of the basement roof which was related to a high-resistivity magnetotelluric horizon. The morphology of the basement roof is much different in each profile, however in all cases four zones parallel to the orogen axis were separated. In the outermost zone the basement roof occurs at a relatively shallow depth. South to that zone the basement slopes steeply, then the most buried zone occurs. On the souhern margin of the area a zone of the elevated basement is observed. The results of magnetotelluric sounding interpretaton were subjected to tectonic interpretation.

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## Geological structure of the West Carpathian Flysch Belt and its relation to the Eastern Alps

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The Flysch Belt of the West Carpathians in the eastern Czech Republic is a nappe complex formed by the polyphase Neoalpine orogeny during the Late Peleogene and Early Miocene. Based on lithofacies and tectonics the Flysch Belt is subdivided into the Outer (Krosno-Menilite) and Magura Groups of nappes. Sedimentary record of these units evidences the internal to external parts of the Flysch Belt. This trend results from the general movement of the African plate and the Pannonian block to the N and was manifested in the studied area in the NW and N trending thrusting during the last orogenic events.

The final movements of the Carpatho-Pannonian block system were controlled by an oblique collision with the North European Platform in the Miocene when the Flysch accretionary wedge formed. The collision mechanism diminished towards the E where the subduction process prevailed.

Typical tectonic features of structural types were characterized in cross-sections of the Flysch Belt. General fault pattern encompasses domains with the thrust faults, strike-slip faults, and normal faults.

Geodynamic evolution of the Flysch Belt is characterized using mapping data and analysis of the seismic, gravity, well log, petrophysical and geochemical measurements. Schematic cross-sections show the thrusting mechanism in selected orogenic phases. Subsidence, sedimentation, burial, erosion and thermal history are simulated using basin modeling software.

The frequency-characteristics of seismic and gravity data were processed using combined analysis of the derived gravity field reflectance image and the changes in the seismic echogenity. This technique makes it possible to identify structural-tectonic features from rather low-amplitude seismic and gravity data. It has been applied to draw density-balanced cross-sections of the upper crust layer along the selected seismic profiles with delineation of the tectonic elements.