

## Contribution to the Structure of the Crystalline Basement in Eastern Moravia Based on Geomagnetic and Seismic Data

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Geomagnetic field of eastern Moravia consists of several long-wave anomalies reaching up to 500 nT. Geological section of the area investigated by many seismic profiles and deep boreholes revealed the presence of Neogene, Paleogene, Cretaceous, Jurassic, Carboniferous and Devonian rocks, recently also Cambrian rocks and, finally, the crystalline complex comprising plutonic and metamorphic rocks of Proterozoic age.

A detailed study of magnetic properties has shown that the Neogene and Jurassic strata do not embrace any magnetic rocks. Slightly magnetic layers were found in the Paleogene and Carboniferous strata, the magnetic effect of which reaches only some 10–12 nT. Local occurrences of magnetic tephrites and andesites were found within the Cretaceous and Paleogene sequences. These volcanic rocks may produce expressive anomalies where in outcrops, however, effects of deep-seated small bodies is negligible. Frequent occurrences of distinct magnetic rocks were recognized in plutonic and metamorphic rocks of the crystalline basement; therefore, this basement complex is considered to be the major source of the long-wave magnetic anomalies.

Comparison of magnetic maps with the topography of the buried basement obtained by seismic survey revealed a good coincidence of most of magnetic anomalies with elevations of the basement. This fact allowed to outline a new scheme of the composition and structure of the basement with full respect to the results obtained from boreholes.

An extensive continuation of the Brno and Dyje massifs to the S (as far as to NE Austria) and to the E was indicated, with the buried parts of these massifs being mostly situated at a depth of 1 to 2 km in southern Moravia. Another large and completely hidden granite complex lies beneath the NE part of the

Ždánický Les and Chřiby Mts., and beneath the northern extension of the Vienna Basin. Its upper margin is inclined from the depth level of about 1 km in the NW to the depth of 3.5 km in the SE. As shown by seismic sections, its depth reach is 18 km.

The shallowest magnetic granites and metamorphic rocks (at a depth of hundreds of metres or locally even in outcrops) were proved in the faulted area of the Upper Moravian Depression between the towns of Prostějov, Olomouc, Přešov and Hulín. Further east to the Hostýnské vrchy Mts., the easternmost, mostly intermediate to basic magmatic body lies beneath flysch sequences at a depth of about 1 km. The large areal extent of the hidden plutonic rocks from the exhumed Dyje and Brno massifs in the SW to the Hostýnské vrchy Mts. in the NE permits us to introduce the term „South Moravian pluton“.

The metamorphic envelope mostly represented by paragneisses seems to be – according to the seismic sections – intrafolded among the individual stocks of the pluton to the depth of about 10 km. The most continuous envelope of metamorphites is supposed beneath the Rača flysch unit in the Vizovické and Vsetínské vrchy Mts. and beneath the Cretaceous Silesic Nappe in the northern foothills of the Beskydy Mts. However, the magnetic field pattern and the seismic sections indicate another hidden pluton, „Beskydy granite pluton“, which may continue further E to Poland and Slovakia.

The whole magnetic complex of plutonic and metamorphic rocks is considered to be a constituent part of the North European Platform consolidated by the Cadomian orogeny. The magnetic field structure and the crystalline basement topography indicate the existence of a regional transpressive zone, in which (during a long-lasting high-pressure and high-temperature conditions) the amount of magnetic minerals increased and where the plutons were squeezed to upper structural positions.

## Evolution of the Northern Part of the Paleogene Central-Carpathian Basin, Slovakia

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The fore-arc Central-Carpathian Paleogene Basin (CCP Basin) lies in the northern part of the Central Western Carpathians. The tectonics and sediments of the basin suggest a complex kinematic history with prevailing extensional regime and minor compression mostly occurring in its northern part. The main volume of the CCP Basin fill deposits consists of deep-water turbidite systems mostly elongated in the SE–NW direction in the eastern part of the basin and in the NW–SE and W–E direction in the western part of the basin. Minor volume of the basin fill is composed of transverse, mostly gravity-flow aprons.

The basin fill consists of sedimentary succession divided into 4 units reflecting different stages of the basin evolution. Based on the analysis of the reflection seismics and deep boreholes, the maximum thickness of the sediments is estimated at some 4,000 m. Breccias, conglomerates, sandstones and sandy limestones, originating in a shallow-water environment, comprise the base of the succession (Unit 1). The age of the unit, determined by analysis of nummulite fauna, is the late Middle Eocene and Late Eocene (Bartonian and Priabonian, P14–P15 zones of planktonic foraminifera). The overlying Eocene to Early