



Geophysical modeling of geological profiles by the terrestrial geomagnetic investigations

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Geomagnetic methods of investigation are based on the fact that the magnetic characteristics of rocks and minerals, from which the Earth's crust is composed, differ from each other. On the basis of the measured elements of the Earth's magnetic field and the calculated anomalies, we draw conclusions on distribution of magnetic bodies within the Earth's crust. Basic condition for application of this method is the difference between magnetic characteristic of a geological body and the surrounding rocks. Interpretation of the results of geomagnetic investigations is based on the fact that the Earth's magnetic field is uniform in the areas made of rocks with homogeneous magnetic composition, while it is deformed where the magnetic composition is more or less inhomogeneous. In order to understand the investigation area better, geomagnetic measurements with proton magnetometers were performed along the three profiles striking generally N-S. The distances between the profiles were about 10 km, while the distances between the points along the profiles were 1-5 km. Also, detailed geomagnetic investigations were performed by measuring total intensity of the magnetic field by proton magnetometers. Besides, structure elements were measured in the field. Measuring of total intensity of the geomagnetic field was performed along 11 sections, and some of them will be analyzed. All the cross-sections are in the West Serbia region, between Kosjerić and Valjevo, on the slopes of Maljen and Povlen Mts., and they were set perpendicular to the boundaries of different geological units (parts of the Jadar block, Drina-Ivanjica Element, Vardar zone ...). Average length of these cross-sections is 200 m. These data were added to those from the database of the Institute of Geophysics at the Faculty of Mining and Geology, for better defining the anomalies of the magnetic field in the investigation area. Lower anomalies were registered in a smaller part of the area and they are related to the thick series of bedded limestone. Lo-

calities with high anomalies cover the southeastern part of the area and they are related to the serpentinites with different degree of metamorphism. Beside the measurements of total magnetic field, data on structural elements were taken in the field and samples were taken for laboratory analyses in order to obtain data on density of rocks. It all enabled production of the map of anomalies of the gravitational field. On the basis of spatial distribution of the total intensity of geomagnetic field and gravitational field, together with analysis of geologic map, regional profiles were drawn perpendicular to the main geological units on Western Serbia. Modeling of gravitational, geomagnetic and geological profiles enabled defining of the major geological units in the investigation area, but in the same time, it showed a necessity for further detailed complex field investigations because of completing the stratigraphic and tectonic interpretations.