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GEOLOGICAL INTERPRETATION OF POTENTIAL FIELDS FOR THE UKRAINIAN SHIELD

Creating a geological section from the geophysical data is an important task for many purposes. These include geological mapping, search for mineral resources, monitoring of dangerous geological processes and others. The area of research is located within the Ukrainian shield. Regional geological modeling can be done from the data of the gravity survey. Areas of different crystalline rocks were identified due to the density characteristics, tectonic disturbances were traced from the gravitational data. Magnetic data had greater contrast of values and allowed to reveal more detailed geological structures. The combination of geological information with the data of potential fields made it possible to build a geological section. The area of the study is located on the right bank of the Dnipro river. This territory belongs to the depositional plain of the north-eastern part of the Ukrainian Shield. The type of relief is defined as plain that is not much different in an altitude. The geological structure involves complicated dislocated Precambrian rocks and loose sheets of Meso-Cenozoic formations. The crystalline basement is a deeply eroded and folded much granitized formation, complicated by a large number of tectonic disturbances.

The method of mass consecutive accumulation was used for the modeling of section on density. This approach is close to the physical processes of moving substances. The gradual accumulation of magnetic susceptibility was used to determine the geological boundaries due to the common interpretation of potential fields and established the distribution of the physical parameters. The geological

section was created based on these data and geological information (Fig. 1). Structural maps containing Precambrian boundaries and disjunctive violations were built.

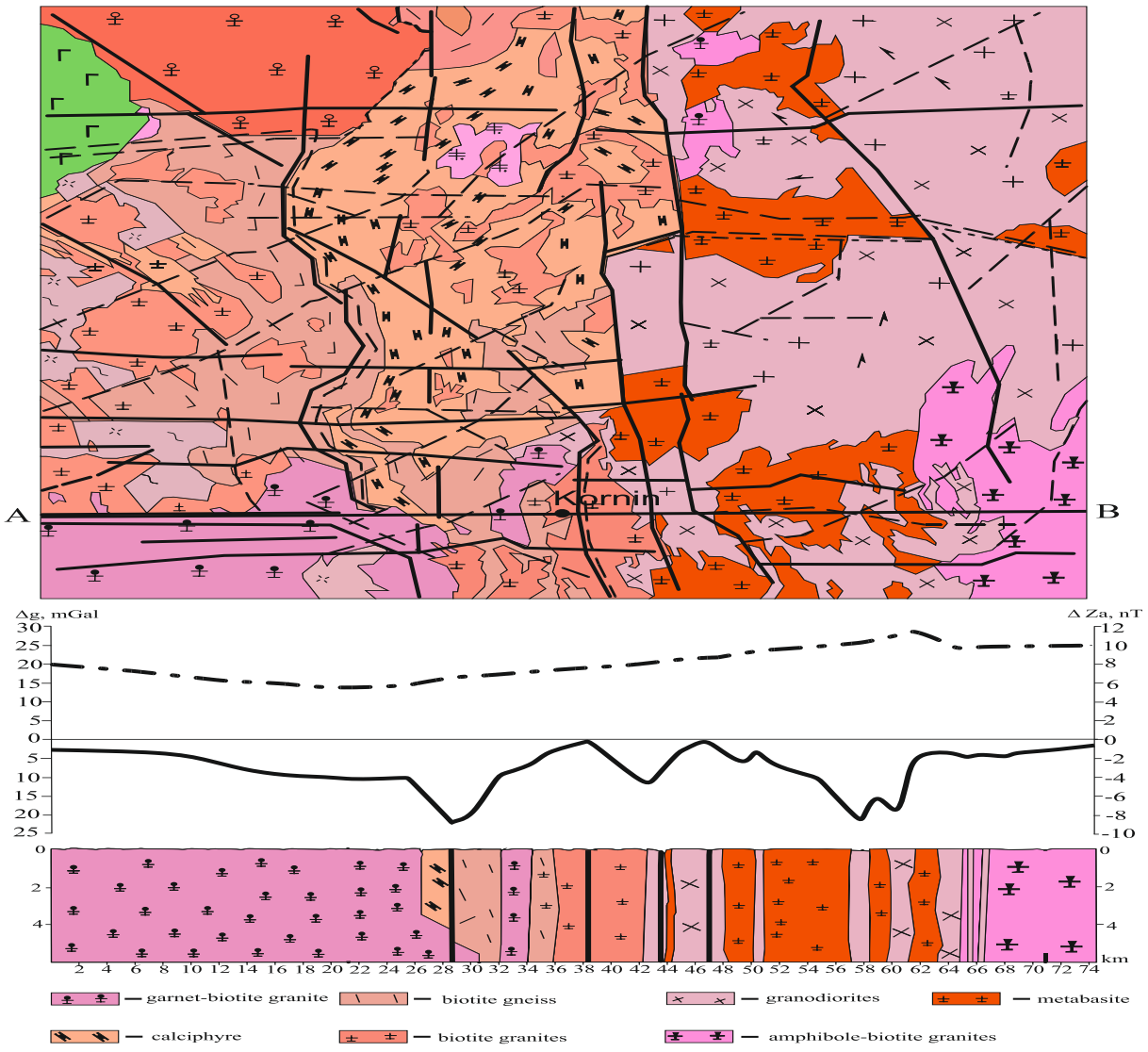

Figure 1: *Tectonic framework of the Ukrainian Shield*

These gravity and magnetic data have been interpreted and supplemented by the results of geological drilling. The task of the magnetometry was to identify areas of different composition and magnetic properties of crystalline rocks, identification and traceability of tectonic disturbances.

The area of research has structural fold-blocked configuration of the Ukrainian Shield (2003). In structural terms the study area can be divided into two parts the

eastern and the western ones. The frontier of these blocks is Skvyrska fault zone, which is close to the town Kornyn. In the north it coincides with Brusylivsky fault.

This fault zone plays a key role in forming of geological area. It separates the western and eastern tectonic blocks. They are called Teteriv-Kocherovsky and Makariv-Fastivsky, respectively. The western block is made up mostly of garnet-biotite, biotite granites and gneisses. The eastern block is structurally very different from the western one. Its structure serves as a prime example of ultrametamorphism and granitization processes. The basic geotectonic structure in this block is created by a large body of metabasites located among granitoids.

In general, the magnetic field of the researched area has negative values. Increasing field is associated with granite (biotite, garnet-biotite, amphibole-biotite). The lowest magnetic values describe the placement of metabasites, gneiss and granodiorites. Gravity field is characterized by positive values. The most positive indicators were observed in granodiorites.

The interpretation of potential fields and geological data allowed to a full study of the structure of the area. Gravity data have identified a common geological structure. The latitudinal interpreted profile has defined two tectonic foundation blocks: the western and the eastern ones. Magnetic profile singled out a number of vertical units that are associated with the processes of metamorphism and granitization.

References

1. State Geological Map of Ukraine, scale 1: 200,000 (Fastiv). - Kyiv. Ministry of Ecology and Natural.