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Integrated dynamic interactive models of ore-magmatic centres in Uzbekistan

Irina Sidorova

Institute of Geology and Geophysics, Head, Lab.of Lithosphere structure, Tashkent, Uzbekistan (sidoirina@yahoo.com)

This study was made with complex geophysical and geological observations by the DSS-MRW seismic reflection and refraction profiles, which cross Uzbekistan. The aim of our study was to reveal new features, which are characteristic of the upper mantle rocks, related to morphology of bodies, their physical properties, consisting mainly in their contrasting values for contiguous blocks, and general increased velocity and density of the rocks they contain. The methodology of establishment of integrated dynamic interactive models on ore-magmatic centres consists of two consecutive stages including: 1) the methodology of integrated geological-geophysical processing and interpretation of potential fields and seismic profiles cross cutting ore-magmatic centres; 2) the methodology of creation of a united interactive 3-D model in ArcGIS in combination with materials of remote sensing. Each of these stages is divided into more detailed sub-stages. During the study of the deep structure of ore-magmatic centres, the first step is the integrated methodology of the processing and interpretation of potential fields. It is mainly orientated at the identification of positions of geometric borders of the division of mediums determined by the data of seismic exploration of preferably deep seismic sounding. Our experiences shows that the use of these potential fields for the area zoning of the territory, identification of the depth of manifestation of isolated blocks and their density may significantly affect the interpretation of seismic exploration data. Therefore, the implementation of the method-based interpretation of data of gravitational and magnetic fields preceding, the stage of the construction of the integrated model enables a more complete use of opportunities of these methods. Anomalous objects are isolated in the Earth crust on the basis of the interpretation of potential fields using the methods of the solution of direct and inverse tasks. An integrated interpretation of potential fields enablers the maximal use of information available in this field for the analysis of the deep structure. The processing of data is an important integrated part of the whole process of development of the 3-D model of the ore-magmatic centre within the frames of the GIS project. New regional features have been revealed: they include peculiarities of the Earth's crust's deep geological structure and spatial distribution of deposits; they are contact areas of the Earth's crust geoblocks with anomalously high and low seismic and density parameters. Mapping of these zones helps select new ways in the search for mineral deposits.