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THE SYSTEM OF DISCONTINUOUS DISLOCATIONS OF THE SOLOTVYNO DEPOSIT AND THE METHODOLOGY OF THEIR STUDY ON THE EXAMPLE OF ONE EXPOSURE

The study of discontinuous dislocations is one of the main tasks of geological mapping of all scales. Disruptive faults and zones of tectonic fracture control the location of many mineral deposits, determine their quality, mining and geological conditions of development. Studying them, it is important not only to identify and trace discontinuous dislocations in space, but also to establish their systems, kinematic types, conditions of formation, age and stages of their activation both in space and time [1]. Often on state geological maps, kinematic types of discontinuous dislocations, possible stages of activation and the conditions of the stress state of the subsoil at these stages have not been fully clarified.

The purpose of this work was a detailed study of discontinuous dislocations of different levels (from tectonic cracks to discontinuous faults) on one of the rock outcrops near the area of the Solotvyno salt deposit. The research area tectonically refers to the Solotvyno depression of the Transcarpathian depression and consists of tuffaceous and sandy-clay rocks of early Neogene age [2-4].

Main tasks of the research: study the lithological composition of rocks and their stratigraphic position on the outcrop, to determine the elements of rock formation; establish discontinuities and zones of tectonic fracturing in the rocks of the lower Neogene; carry out mass measurements of the elements of the occurrence of discontinuous dislocations (rupturing faults, tectonic cracks, shale disintegration); determine its kinematic type and elements of the occurrence of grooves and sliding strokes on sliding mirrors; reconstruct the paleostress fields of the rock massifs at observation point; determine whether this system of dislocations can be favorable for the migration of groundwater in the studied area.

Since rupture tectonics directly affects the mining, geological and hydrogeological conditions of the development of salt deposits and, in general, the ecological state of the environment, it was advisable to conduct detailed complex field studies of rupture dislocations in rock outcrops with the involvement of special tectonophysical methods [1-6]. The methodology of field research near the city Solotvyno, both on this outcrop and on others, included both traditional structural geological methods and methods of tectonophysical research. Mass measurements of the elements of rock formations and deformational mesostructures (tectonic cracks, veins, discontinuity faults, folds) were carried out, typification of cracks into detachments and chips was carried out, veins and crack filling material were studied. The composition of rocks was determined with the selection of samples (including those oriented in space) for petrographic studies under a microscope. Tectonophysical studies were carried out using the methods of structural and paragenetic analysis and the method of kinematic analysis [1, 3]. Types of tectonic cracks and faults (R, R', L – systems), T-structures, inversions of layers and shale formations of rocks under fractures and their spatial relationships were determined.

On the basis of field studies and results processing, a rose-diagrams of the extension of discontinuous dislocations of the research area were simulated (Fig. 1, 2).

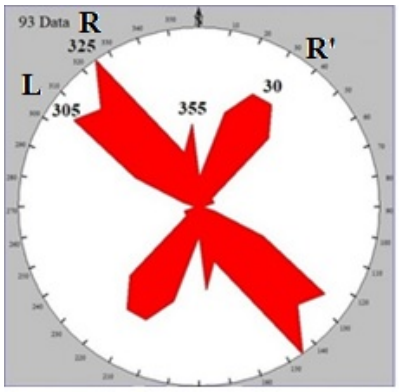

Fig. 1. System of tectonic cracks and faults

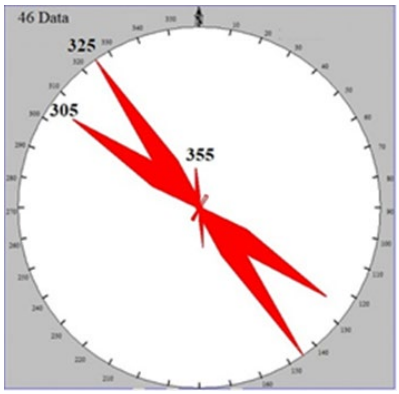

Fig. 2. Tectonic schistosity systems

The fault was established in the rock outcrops, which is presented by a zone of tectonic breccia and rock cataclase with a thickness of up to 40 cm, which is limited on both sides by L-cracks with sliding mirrors (Fig. 3). On these fractures, right-shear and right-slide-shear. The suture zone has a northwesterly extension along an azimuth of 300° with a dip to the northeast at an angle of 70°. L- systems tectonic cracks with furrows and slip strokes on planes are developed in the wings of the discontinuous fault. The angle of incidence of furrows changes from 25-30° to 40°.

Fig. 3. Fault seam zone (red lines show the L-systems tectonic cracks with slip lines (slickensides))

The stress state of the rock massifs was studied by tectonophysical methods. Based on the results of research, it was established that in the area is dominated shear type of stress field. Against the general background of the shear stress field, the established fault was formed in the mode of the reset field with the axis of tension across the strike of the fault.

In general, according to the research results, it was established that the "Solotvyno" site has a complex of geological and tectonic structures with the development of folded and discontinuous dislocations. Disruptive dislocations are represented by tectonic cracks and discontinuous faults, cleavage zone and flaking of rocks.

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