

The Prediction of geodynamic conditions of mining of Elkon uranium field (Eastern Siberia, Russia).

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The Elkon uranium ore area in Russia as far as geotectonics is concerned is located in the Aldan shield. Like the whole central area of Aldan shield, the Elkon area is characterized by a complicated combination of geological structures including ore-bearing structures forming together a three-level fold-block construction.

For the area a digital map of the relief was processed with the use of algorithm Monolith and modeling stress and strain of rock masses of finite element method.

With account for rock characteristics, the mean intensity of stress in the rock mass unbroken sections is approximately 25 MPa. Being the threshold of analyzing stress distribution in the model, this value is relative. In individual local segments of the rock mass, calculated values σ_i exceed 80 MPa, and in the zones of increased stress, they decrease to 20 MPa and less.

High level of differentiation of σ_i distribution in the model allows us to separate potentially dangerous zones (both the zones of likely destruction of rocks in the dynamic form with increased stresses and rock inrush zones in the areas of rock mass discharge), which are of practical interest in the context of the task we set.

A feature of stress intensity distribution is a thick zone of stress concentration, which is bend-shaped and extends from north to south in the western area. The rest of concentration zones appear to be oriented at angles close to 45° from northeast to southwest and from northwest to southeast. It generally conforms to the existing stress field and the orientation of uranium ore bodies that are genetically related to fault systems of similar orientation. In the central area of the model the stress level is lower than in boundary parts. Differentiation effect in physical and mechanical characteristics of individual blocks is shown very weakly in the models. Of especial interest are zones of concentrations of values τ_{xy} , which would be missing in homogeneous environment with this calculation scheme.