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# Construction Of Dynamical Model For Evolution Of Rock Massive State As A Response On A Changing Of Stress-Deformed State.

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Rock massive can be described by four functions: structure, physical features, content and state. The last feature plays the main role by forecasting the dynamical events which can occur in it. The energy and intensity of the dynamical events depend from the volume of the massive and the space-time changes of the influence on it. The influence can me man-made or natural origin. Thus it is very revising to construct a physical and mathematical model of the dynamical state evolution of the massive, using the theory of open dynamical systems. For that we used the detailed seismological information of a mining seismological catalogue, which contained information of the energy of explosions, provided in the massive and the energy of its response. Using the qualitative analysis of phase trajectories constructed on the plane with coordinates lgE and d/dt(lgE), where E is the summary energy of the massive response between the influences on it by explosions we observed some repeating regularities, which are a transitions from the chaotic state to an ordered and backwards. The chaotic state of a small energy level is a stable state of the rock massive influenced by outer energy incoming.

The second feature of the state evolution is: the local volume massive does not immediately respond on the changing of the surrounded it stress state. Therefore it stores the response energy and then extracts it through a high energy dynamical effect. It is very significant to define the time of reaction lagging, in spite of the influence on the massive can be assumed as elastic. The unique model which can explain that effect is a model of the massive with a hierarchic structure. We developed a mathematical algorithm using integral and integro-differential equations for 2-D model for two problems in a frequency domain: diffraction a sound wave and linear polarized transverse wave through a arbitrary hierarchy rank inclusion plunged in an N-layered medium. That algorithm differs from the fractal model approach by a more free selecting of heterogeneities position of each rank. And the second the problem is solved in the dynamical approach. The higher the amount of the hierarchic ranks the more is the degree of nonlinearity of the massive response and the longer can be the time of massive reaction lag of the influence.